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DISEASES CAUSED BY BACTERIA AND FUNGI.

TIEDGE, L. (1936). Ein Beitrag zur Aetiologie und Therapie der bösartigen Druse. [**Cause and Therapy of Malignant Strangles**].—*Tierärztl. Rdsch.* **42.** 847-849. [3 refs.]

T. claims that the malignant course which strangles often runs is chiefly due to the superimposition of an infection with *Salmonella enteritidis* (Gärtner) or *Bact. equirulis* [*Shigella viscosum*, *B. viscosum equi*, *B. nephritidis equi*]. He states that these secondary invaders can often be found in the urine during life. One outbreak ceased at once after the administration of " paratyphus " serum and vaccine, and a second after " paratyphus " serum only. *S. enteritidis* had been isolated from cases in both outbreaks.

Another outbreak on a farm where *Bact. equirulis* had in one case been isolated ceased, following the administration of " viscosum " serum.—A. W. STABLEFORTH.

I. EVANS, Alice C. (1936). **Studies on Hemolytic Streptococci. III. Streptococcus equi and Related Strains.**—*J. Bact.* **32.** 541-556. 3 tables. [Numerous refs.] [See also *V. B.* **7.** 49].

II. HODGE, H. M., & SHERMAN, J. M. (1937). **Streptococcus equinus.**—*Ibid.* **33.** 283-289. [11 refs.]

I. A review is given of the literature of *Str. equi*, and the characteristics of the species as observed in 20 cultures isolated in the U.S.A. (16 strains) and Denmark (4 strains) are described. Eleven strains agreed in every characteristic, and one, No. 725, from equine strangles, is taken as the type strain. Salicin was fermented but not lactose, mannitol, trehalose or sorbitol : there was no growth on 10% bile blood agar ; sodium hippurate was not split, or human fibrin lysed ; the final pH in glucose broth was 5·2. Growth in plain infusion broth was scanty, but good growth occurred in serum broth at 37°C. and slowly at 20°C. Colonies on blood agar were 1·5 mm. or more in diameter at 48 hours, watery and strongly haemolytic. This strain was sensitive to 4 named phages in the nascent state and to the filtrate of one of them. Nine other strains only differed with respect to their susceptibility to one or other of the phages and are regarded as variants. *Str. equi* does not produce significant agglutinins in rabbits. It is highly virulent for mice but not for rabbits or g. pigs.

None of a collection of 400 strains from human sources was *Str. equi*. Those reported as such by other workers are placed in other groups. Strains from equine "strangles" are not all *Str. equi*.

II. H. and S. have studied in detail 72 strains of streptococci, isolated from fresh horse dung, which did not ferment lactose. All are classed as *Str. equinus*. The outstanding characteristics of the species are regarded as the following:– a high minimum growth temperature (21°C., growth being then very slight) and a high maximum (usually 45°C.); low thermal resistance (usually less than 60°C. for 30 minutes); feeble action on 2% glucose litmus milk with little reduction; inability to split sodium hippurate or starch, to produce ammonia from peptone or to ferment arabinose, xylose, glycerol or mannitol. These, with the general "pattern" of reactions given in other tests by this species, mark its boundaries fairly clearly. Variations noted in regard to sucrose, raffinose, inulin and salicin agree with those originally noted by ANDREWS and HORDER, and are not regarded as offering a sound basis for the further division of the species.—A. W. STABLEFORTH.

NEWSOM, I. E. (1937). **Strangles in Hogs.**—*Vet. Med.* **32.** 137-138. 2 figs. [2 refs.]

N. describes an outbreak of strangles involving 30 six-month-old pigs. Some were coughing and wheezing. *Post-mortem* examinations revealed in the throat region multiple tense abscesses containing an odourless yellowish-green pus. This pus yielded a pure culture of a haemolytic streptococcus, producing acid from dextrose, sucrose, mannitol, laevulose, sorbitol, maltose and dextrin but not from lactose, dulcitol, salicin, mannose, glycerol, arabinose, inulin, inositol, xylose or rhamnose.—C. V. WATKINS.

MINETT, F. C. (1937). **Studies on Bovine Mastitis. XII – Mastitis due to Staphylococci.**—*J. comp. Path.* **50.** 101-121. 4 figs., 6 tables. [Numerous refs.] [See also *V. B.* **6.** 391].

An account is given of cases of mastitis, acute and chronic, due to pathogenic staphylococci (*Staph. aureus*), and the literature on the subject is reviewed. In its most common form the disease is chronic, but non-suppurative in the ordinary sense; enduring infections lead to a diffuse induration of the gland owing to reaction on the part of its stroma and in consequence there is a decrease in milk yield, with qualitative changes in the milk such as excessive alkalinity, increase in leucocytes, lowered specific gravity and solids-not-fat content. Data concerning several cases are quoted in order to illustrate these points.

Staph. aureus is wide-spread in the udders of cows, and its importance arises in part from the fact that, unless a proper bacteriological examination is made, changes that may be produced in the milk will be confused with those of a more severe nature due to streptococci. *Staph. aureus* must be distinguished, however, from non-pathogenic staphylococci, which are common in udder milk, and herein lies the importance of the technique adopted. The characters of some common udder saprophytic cocci and of *Staph. aureus* are tabulated. Plain agar is not sufficiently differential for staphylococci. Horse-blood agar, which is now frequently used in examining milk for streptococci, is unsatisfactory because horse corpuscles are relatively insusceptible to the toxins (lysins) of *Staph. aureus*. Agar containing 5% defibrinated ox or sheep blood – preferably from young animals and so containing little or no natural antitoxin – is suitable because in this medium udder strains of *Staph. aureus* produce a characteristic appearance, namely, pale fawn colonies resting on a clear zone which is surrounded by an area of altered blood pigment.

The numbers of *Staph. aureus* in the milk of individual quarters vary greatly from time to time, but the highest counts were obtained by plating gravity cream.

PAGNINI, U. (1936). Contributo alla conoscenza degli agenti causali della mastite necrotica e della necrosi epatica miliare multipla nei bovini. [**Necrotic Mastitis and Miliary Hepatitis in Cattle**].—*Nuovo Ercol.* **41.** 483-496. 2 figs. [Numerous refs.]

P. records a case of mastitis in a cow in which one quarter was affected. On examination, the quarter was found to be nothing but a large abscess cavity. Lesions of necrotic hepatitis were also present, but the other organs appeared normal. Bacteriological examinations revealed that the lesions were due to a non-haemolytic streptococcus.—J. A. NICHOLSON.

VAN ES, L. (1937). **Anthrax in Swine.**—*J. Amer. vet. med. Ass.* **90.** 331-340. [9 refs.]

The author emphasizes the greater resistance of swine to anthrax, as compared with herbivora, and the consequent difference in the symptoms and lesions. It occurs enzootically in some of the large pig producing areas in the U.S.A. and the majority of cases probably escape notice. The feeding of cattle carcasses to pigs is the most commonly recorded mode of transmission of the disease.

The primary lesions of the acute form of the disease are usually in the pharyngeal region, while in the chronic disease the lesions are found in the intestines. These are sero-haemorrhagic or haemorrhagic-necrotic in character and usually occur in the duodenum and jejunum. Affected areas are swollen and sharply outlined at their borders. If extensive the affected bowel resembles a piece of garden hose with a small lumen. Necrotic areas are small and scattered or cover the whole of the diseased area as irregularly shaped ulcers, especially near the mesenteric attachment, being apparent through the wall of the bowel as yellowish-grey or reddish-grey eschars. Cicatrization produces irregular scars with contracted margins and occasionally stenosis and even peritoneal adhesions. In prolonged cases fibrinous peritonitis sometimes causes adhesions of loops of the intestines. Necrotic areas are also seen in the lymph nodes which become dark red, then gradually paler and pinkish and finally a greyish-yellow. The necrosed areas become drier and secondary infections sometimes cause purulent foci. Bacteriological methods are necessary for diagnosis.

The author draws attention to the risks involved in the uncontrolled movements of livestock in vehicles. Chronic cases of the disease have to be considered in this connexion.—C. V. WATKINS.

BAECKMANN, K. (1936). Der Milzbrand. [**Anthrax**].—*Münch. med. Wschr.* **83.** 134-137. [Numerous refs.]

METZULESCU, A., & CZICKELI, H. (1936). Der Milzbrand. Bemerkungen zur Arbeit " Der Milzbrand " von Dr. Karl Baeckmann. [**Comment on Dr. Karl Baeckmann's Article on Anthrax.** *Münch. med. Wschr.* **83.** 134-137].—*Ibid.* 530-531.

BAECKMANN, K. (1936). Schlusswort. [**Reply to Comment on Article on Anthrax by Metzulescu, A., & Czickeli, H. in** *Münch. med. Wschr.* **83.** 530-531].—*Ibid.* 531-532.

The problem of anthrax in man is surveyed by the writers with special reference to methods of infection and to therapy. The possibility of the occasional spread of infection by biting flies is considered, but is thought to be of little importance. Control of the disease in man is dependent upon successful veterinary

control of a world-wide character. [It should be realized that even if perfect veterinary control of all new cases was achieved in all countries, there would still remain ample source of infection beyond veterinary control as result of the almost unlimited viability of anthrax spores].—E. J. PULLINGER.

NIEBERLE, K. (1937). Ueber die Infektionswege der tuberkulösen Erkrankung bei jungen Kälbern. I. Versuche an Kälbern. II. Die Inhalationstuberkulose. III. Die kongenitale Tuberkulose. IV. Die Fütterungstuberkulose. [**Paths of Infection in Tuberculosis of Young Calves. I. Experiments on Calves. II. Infection by Inhalation. III. Congenital Infection. IV. Infection by the Alimentary Tract**].—*Arch. wiss. prakt. Tierheilk.* **71.** 323-331, 332-346, 347-355 and 356-363. 7 figs. [11 refs.]

This series of papers forms a small part of an investigation which N. is carrying out with financial assistance from the German government. The pathogenesis of tuberculosis in the domestic animals forms the subject of this extensive survey and a number of papers have already appeared during the last few years.

I. Five three-week-old calves, which were negative to the tuberculin test, were given *per os* in milk, doses of a culture of tubercle bacilli [presumably of the bovine type] varying from 0·02 to 0·4 g. The doses were spread over a period of 3-11 days and were given daily. At the conclusion of the test all the animals gave a positive tuberculin reaction and were slaughtered 18 to 38 days after receiving the first dose. A careful *post-mortem* examination was made and histological sections were prepared. In four calves, tuberculous lesions were found in the tonsils and retropharyngeal lymph nodes; in the fifth animal the tonsils alone were affected and there was also present a tuberculous bronchitis and broncho-pneumonia. In the calves killed 38 days after the first dose of bacilli, the mesenteric lymph nodes also showed tuberculous lesions. The portal lymph nodes were unaffected in every case. It is concluded that if there exists in young calves tuberculosis of the portal lymph nodes alone, it is reasonable to conclude that infection took place through the placenta and was not alimentary in origin.

II. In 18 calves between the ages of 3 and 12 weeks (mostly 4 to 6 weeks), primary tuberculosis of the lung and mediastinal lymph nodes is described. In the three-week-old calves, it was already possible to detect the presence of calcification with the aid of the microscope; in those five to six weeks old such calcification was clearly visible to the unaided eye. These findings are to be compared with those of previous workers who have usually considered 50-70 days as the minimum time required for the development of calcification in tuberculous lesions.

A second series of 28 calves between 3 and 12 weeks old is used to illustrate incomplete primary tuberculous complex of the lung-lesions in the mediastinal lymph nodes without corresponding pulmonary lesions.

III. This deals with 56 cases of tuberculosis of the liver in two to seven-week-old calves. N. considers that most of these cases represent congenital infection. In eight of these animals the disease had spread to the mediastinal lymph nodes, whilst in 15 calves it had progressed further to generalized tuberculosis.

IV. In a series of 15 calves, primary tuberculosis of the mesenteric lymph nodes was found and in no case was it possible to find macroscopic lesions in the intestinal wall. Histological studies are needed to determine whether the bacilli are able to pass through the wall without leaving visible evidence of their passage or whether the changes produced undergo resolution and become visible only under

the microscope. There is some evidence that the latter hypothesis is correct in some cases at least.

The observations in this series of papers were made on 117 tuberculous calves which were detected during a careful inspection at slaughter of 20,670 animals.

Primary liver tuberculosis was found in 56 cases, primary pulmonary lesions in 46 and primary alimentary lesions in 15. Congenital infection is thus the most important route, but, because of the danger of tuberculous mastitis, the importance of alimentary infection should not be underestimated. Owing to the greater frequency of pulmonary tuberculosis in cows the opportunity for pulmonary infection is greater than that for infection by the alimentary route.—E. G. WHITE.

I. WIGHT, A. E. (1937). **Progress and Status of Cooperative Tuberculosis Eradication Work.**—*J. Amer. vet. med. Ass.* **90.** 353-358.

II. BUTLER, W. J. (1937). **Reaccreditation of Range and Semi-Range Modified Accredited Tuberculosis-Free Areas.**—*Ibid.* 358-363.

III. SMITH, H. R. (1937). **Problems and Policies in completing Tuberculosis Eradication.**—*Ibid.* 363-370.

IV. MARSHALL, C. J. (1937). **The Early History of Bovine Tuberculosis Control Work in Pennsylvania.**—*Vet. Ext. Quart. Univ. Pa.* **37.** 8-11.

I. This report deals with the progress made in the status of the co-operative campaign to control and eradicate animal tuberculosis in the U.S.A. during the year ending June, 1936. Almost 23 million tuberculin tests were applied to cattle, disclosing 165,000 (0·7%) reactors. The incidence of tuberculosis among cattle tested was just about one half of what it was during the previous fiscal year. The number of accredited herds remained the same as in the previous three years, the largest number of such herds being found in New York State. 166 counties were added to the list of those in the modified accredited area where less than 0·5% of the cattle are affected with tuberculosis. Amendments have been made in the regulations dealing with interstate shipment of cattle from modified areas. The report further deals with progress made in the reduction of avian tuberculosis and in the number of slaughtered cattle affected with disease.

II. B. puts forward a plea for accurately recorded *post-mortem* inspection of carcasses of range animals originating from accredited areas with a view to detecting the occurrence of fresh infection. He contends that repeated tuberculin testing of range cattle is costly and that the above method would serve as an adequate control. He advocates that there should be a definite co-operative system of meat inspection throughout the U.S.A., governed by the Bureau of Animal Industry.

III. This paper presents statistics dealing with the decline of bovine tuberculosis in the U.S.A. following the eradication scheme commenced in 1916. In that year 2·3% of all cattle slaughtered under federal inspection showed lesions of tuberculous infection on *post-mortem* examination and a total of 30,720 cattle and 74,109 swine were condemned as inedible. Since 1916 over three million reacting breeding and dairy cattle have been removed from herds following a positive tuberculin test. During 1936 only 4,027 (0·18%) of all the cattle slaughtered, exclusive of reactors, were affected.

IV. This is a short account of the success attained in reducing the incidence of bovine tuberculosis to 0·5% in Pennsylvania. The campaign has been marked by three periods – the first, a pioneer period beginning in 1892, was followed by the Pennsylvania Plan of 1896 which in turn was succeeded by the Federal-States Accredited Plan of 1919.—S. J. EDWARDS.

I. Torrance, H. L. (1936). **The Detection of the Tuberculous Cow.**—*Vet. Rec.* **48.** 1293-1306. 8 tables. [2 refs.]

II. Brook, G. B. (1937). **The Clinical Examination of Cattle for the Presence of Open Tuberculosis as Practised in the Ostertag Method of Tuberculosis Control and Eradication.**—*Ibid.* **49.** 279-292. 18 figs., 3 tables. [Num. refs.]

III. Anon. (1937). **The Clinical Diagnosis of Bovine Tuberculosis.**—*Ibid.* 298-300.

I. The administrative procedure that may be adopted under the Milk and Dairies Order (1926) and the Milk and Dairies (Consolidation) Act (1915) are presented and T. indicates the most suitable scheme for the detection of the tuberculous cow. It has been possible to compare the results of herd milk sampling, which was the procedure adopted by the Nottingham County Council up to 1934, with those obtained by the present practice of biological examination of the milk together with routine clinical examination. Under the first system samples of mixed farm milk were collected by a milk sampler who was also instructed to enquire from producers if any cows with chronic cough were present. The second system involves routine clinical examination of the herds together with collection of mixed milk for biological examination, samples from about 45 cows being bulked as one sample. T. presents figures of results obtained by the two methods and points out that while herd milk sampling is of the greatest value in the detection of cows suffering from udder tuberculosis and is, therefore, a valuable public health measure, it has the great disadvantage that the only herds examined clinically are those contributing to a positive sample. Apart from its greater educational value, routine veterinary inspection leads to the detection of a greater number of cases of pulmonary tuberculosis and tuberculous emaciation.

II. B. reviews the technique of Ostertag's method for the diagnosis of open tuberculosis which he saw in practice in Sweden, Germany and elsewhere. In the first place the methods of stimulating respiration for the purpose of revealing unnoticeable cough are described ; of the five methods Christenson's rubber cone and Magnusson's sheet are preferred. Specimens of mucus are taken from any animal which shows any abnormality in respiration or which coughs after stimulation. Figures are given showing the correlation between abnormal respiratory sounds and the presence of pulmonary tuberculosis. For instance Magnusson found that 61% of animals showing a cough were affected and Jerlov found that 83% of affected animals showed this symptom. Various methods of obtaining mucus are described and illustrated, the two principal instruments being the Rautmann " sputum cup " and the Müller-Beck " direct tracheal swabber ". The mucus is then examined for the presence of tubercle bacilli, the general practice being to inoculate g. pigs after microscopic examination.

The value of cultural diagnosis was being assessed in two laboratories. By combining clinical and bacteriological diagnosis, Magnusson found that 11·9% of cattle examined by him in Sweden were affected with open tuberculosis and Marcusson in the same country found an incidence between 3·6% and 8·75% ; Wagener in Berlin found 8·9%. It is stated that these methods fail to detect 30% of the total open cases in a herd. This is held to be due to the fact that some open cases exhibit no detectable symptoms when examined by the Ostertag method, whilst others excrete bacilli intermittently. On the other hand the tests may show erroneous results in healthy cattle and various reasons for this are given. The udder is examined on the lines usually followed in England and the uterus is examined in suspicious cases. B. concludes that it is unnecessary and probably impracticable to substitute the Ostertag method for the present English clinical examination, even where tuberculin testing and total eradication is the objective.

III. An editorial article devoted to a criticism of the methods described in so far as they are applicable to the eradication of bovine tuberculosis in England.—S. J. Edwards.

I. Pröscholdt, O. (1937). Ausschnitte aus der Tuberkulosetilgung in Pommern. [**Tuberculosis Eradication in Pomerania**].—*Dtsch. tierärztl. Wschr.* **45.** 65-73. 2 tables.

II. Karsten. (1937). Ergebnisse der bisherigen Tuberkulinprüfungen in Rinderbestanden der Provinz Hannover. [**Results of Tuberculin Tests in Hanover**].—*Ibid.* 86-87. 1 table.

III. Pröscholdt, O. (1937). Einiges über die Tuberkulinprüfung der Rinderbestände. [**Tuberculin Tests on Cattle**].—*Ibid.* 87-90. [4 refs.]

IV. Weisgerber. (1937). Statistisches zum Tuberkulosetilgungsverfahren in Ostpreussen. [**Tuberculosis Eradication in East Prussia**].—*Ibid.* 91-94. 3 graphs.

V. Anon. (1937). Die Verbreitung der Tuberkulose in den deutschen Rinderbeständen im Jahre 1936. [**Bovine Tuberculosis in Germany in 1936**].—*Tierärztl. Rdsch.* **43.** 154.

I. Eradication followed orthodox lines and included clinical examination with laboratory tests of bronchial mucus and milk, the bi-annual application of the tuberculin test, and adequate disinfection of all contaminated byres. Calves of infected dams were segregated for about six months and were tuberculin-tested before admission to the clean herd. All calves were fed on milk known to be free from tubercle bacilli or else on heat-treated milk. Long-term progress reports of the success of eradication are not yet available, but the initial progress has been most satisfactory. At the first test 41 % of 17,846 bovines from 1,023 herds reacted. When animals on infected farms were retested few reactors were encountered and by the sixth test all herds were completely free from reactors.

II. The results are given of tuberculin tests on about 780 cattle from 90 herds which had been subjected to careful clinical examination for 9 years. Only about 17 % of reactors were encountered, spread over 35 herds. In one case all 12 animals in a herd gave positive reactions.

III. A discussion of the comparative merits of the intradermal, conjunctival and intrapalpebral tests, with special reference to the interpretation of doubtful reactions. The discussion contains a large number of figures which cannot be abstracted.

IV. From 1913-1933 the incidence of bovine tuberculosis in Germany remained extremely steady at about 25 % though from 1920-1922 it fell to as low as 15 %. Thereafter from the low level of 1922 both in Germany as a whole and in East Prussia, the incidence rose steadily till the peak was reached in 1930; but whereas in the state as a whole the incidence rose as high as 25 %, in East Prussia it rose from 12 % only up to 15 %. [Figures for East Prussia prior to 1924 are not recorded]. The incidence amongst cows was about 10 % higher than in all other bovines in each case.

V. Out of a total of 45,945 herds of cattle in Germany 37 % are free from tuberculosis, 9 % are still lightly infected and 53 % are heavily infected. The majority of large herds of 50 or more animals have some members which are tuberculous.—E. J. Pullinger.

Doeve, W. C. A. (1936). Tuberculose-bestrijding in Nederlandsch-Indie. [**Control of Bovine Tuberculosis in the Dutch East Indies**].—*Ned.-ind. Bl. Diergeneesk.* **48.** 119-125.

Dr DIEBEN, the Director of the Provincial Veterinary Service of East Java, decided in July, 1934, to control bovine TB. completely by the slaughter of all positive and suspicious reactors to tuberculin, the owners to receive generous compensation. He gives some details of tests in one herd in which the results were unsatisfactory. Doeve considers that diagnosis based on a tuberculin test must remain the best means of controlling TB. infection, but that clinical examination and the registration of " open " cases ought to precede slaughter, as in his opinion the rigorous slaughter of all reactors is not justifiable in a country which is not nearly self-supporting with regard to dairy cattle.

—M. J. J. HOUTHUIS (ROTTERDAM).

REICHLE, H. S., & GALLAVAN, Mae. (1936). **Acquired Resistance to Tuberculosis with Investigations into the Validity of Ranke's Classification.**—*Arch. Path.* **21.** 797-812. 2 figs., 2 tables. [Numerous refs.]

The nature of acquired resistance to tuberculosis has been studied by means of careful *post-mortem* examinations of 81 cases of active tuberculosis in man.

Firstly, it is concluded that an almost inevitable corollary to primary infection of an organ is the involvement of the corresponding lymph nodes. Secondly, if the primary infection is overcome and reinfection of that organ occurs, complete blockade is generally effected by the associated lymph nodes, this being particularly the case in pulmonary infections. Furthermore, there is also a blood (haematic) blockade which is also extremely effective so that true miliary tuberculosis is rarely seen. The prevention of spread by blockade is an indication of resistance, but in the case of tuberculosis, resistance consists of the prevention of spread from organ to organ rather than within an organ. Thus a whole lung may be completely destroyed by infection and virulent tubercle bacilli must be continually discharged into the blood and lymph streams, yet frequently under such conditions there is no spread of active infection to the rest of the body.

The investigation supports the long-standing dictum of KOCH and his co-workers which is not universally accepted, namely, that allergy is a demonstration of increased resistance, and that resistance to secondary infections must be acquired as the result of the stimulus of primary infections. Whether this type of acquired resistance is of more importance to man than natural racial resistance (c.f. European and negro races) could not be decided.—E. J. PULLINGER.

WEDUM, A. G. (1937). **Glycerol and Carbohydrate Utilization by Mycobacterium Tuberculosis.**—*J. Bact.* **32.** 599-611. 2 figs., 7 tables. [Numerous refs.]

Strains of *M.t.* (human, bovine and BCG) utilize glucose, mannose, fructose, galactose, arabinose, xylose, and maltose but not lactose. These strains and also the avian type utilize glycerol completely, producing only traces of end-products other than CO_2 and water. The technique of analysis is detailed.—E. J. PULLINGER.

CROUGUE, O. (1936). Etude d'une petite épizootie due à un bacille du groupe du rouget du porc observée chez les rats. [**Infection of Rats by** *Erysipelothrix rhusiopathiae* **(Swine Erysipelas Bacillus).**—*Bull. Acad. vét. Fr.* **9.** 438-443.

An account of a natural outbreak of disease in rats caused by *E.r.* A study of the cultural reactions of the organism revealed no essential difference between it and a typical porcine strain.—F. BLAKEMORE.

I. PRIESTLEY, F. W. (1936). **Experiments on Immunisation against** *Pasteurella septica* **Infection.**—*J. comp. Path.* **49.** 340-347. 5 tables. [Numerous refs.]

II. Priestley, F. W. (1936). **A Note on the Association of the Virulence of *Pasteurella septica* Infection.**—*Ibid.* 348-349. 1 table. [3 refs.]

I. Only a fully virulent capsulated strain should be used for immunization against *Past. septica.* Vaccines prepared from organisms killed so that the capsule is preserved are shown to be of greater value in protecting mice than those in which the capsule is absent or has been destroyed. The cultures used should be incubated for not more than 24 hours at not more than 37°C., and heating for 30 minutes at 56°C. is sufficient to kill the organism without destroying the capsule.

II. The capsules of *Past. septica* are gradually lost on incubation for periods greater than 24 hours, while at the fourth day they have practically disappeared. This loss of capsule coincides with a distinct decrease in virulence, as shown by mouse inoculation. This decrease is not due to a decrease in the number of viable organisms. It should be noted, however, that a four-day culture, although relatively avirulent, has not lost its power to produce capsules and thus again to become fully virulent.—A. Wilson Taylor.

I. Gibbons, W. J., & Fincher, M. G. (1937). **Hemorrhagic Septicemia.**—*Cornell Vet.* **27.** 52-62. [1 ref.]

II. Stone, W. S. (1937). **Hemorrhagic Septicemia in a Group of Assembled Calves.**—*Ibid.* 62-64.

I. H. S. of the pulmonary type is common in cattle during the winter months in New York State; in the eight outbreaks described the incidence was 14·5% and the mortality 10·9%. In most cases the disease appears only after fresh cattle have been added to the herd, and it is most virulent in the first few cases, or in animals in advanced pregnancy or recently calved. Prophylaxis with bacterins must be conducted with care, as there would appear to be a considerable risk of severe anaphylactic shock, which G. and F. suggest may be due to horse serum in the medium used in their preparation. Homologous immune serum is of value in treatment.

II. A group of 43 heifer calves from different sources, all between three and eight months of age, were housed together in a barn. Five days after the arrival of the last animals, coughing accompanied by a high temperature appeared in most of the group, and haemorrhagic septicaemia serum was given to all. One, six months old calf, died the day after receiving 50 c.c. of serum; in the lungs lesions were seen from which *Pasteurella boviseptica* was recovered. The remainder recovered. In an attempt to incriminate a filtrable virus as well as the pasteurella, a bacteria-free filtrate was prepared from the macerated lung of the dead calf and administered to two normal calves, but infection did not result.—A. W. Taylor.

Lovell, R. (1937). **Classification of *Bacterium coli* from Diseased Calves.**—*J. Path. Bact.* **44.** 125-139. 2 figs. on 1 plate, 6 tables. [Numerous refs.]

In studying strains of *B.c.* from cases of "white scours" in calves L. observed certain strains which formed mucoid colonies consisting of capsulated bacteria. From these colonies grey mutants developed composed of non-capsulated bacteria. The mutants agglutinated in buffer mixtures of lactic acid and sodium lactate, and to higher titres and less specifically by immune sera than the mucoid capsulated organisms.

A specific soluble substance, carbohydrate in nature, from both variants precipitated immune sera. Extracts from capsulated strains and sera prepared by injection of killed mucoid organisms give specific precipitin results. Using the precipitin test 79 out of 110 strains of *B.c.* from calves fell into eight types.

L. concludes that there are special races of this organism pathogenic for young calves and that more than one race may occur in a herd or even in one calf. —D. L. HUGHES.

MINKEWITSCH, I. E., & RABINOWITSCH, D. J. (1937). Zur Frage der Differenzierung des B. coli des Menschen vom B. coli warmblütiger Tiere. [**Differentiation of Human and Animal Strains of** *Bact. coli*].—*Zlb. Bakt. I. (Orig.).* **138.** 197-201. 2 tables. [4 refs.]

M. and R. failed to differentiate strains of *Bact. coli* of human and animal origin when following the method recommended by von Acklin, which depends upon the production of indol in special medium.—E. J. PULLINGER.

GREIG, J. R. (1936). **Enzootic Abortion in Ewes. A Preliminary Note.**—*Vet. Rec.* **48.** 1225-1232. [16 refs.]

In certain districts in Scotland an enzootic form of abortion is common in sheep, 5%-10% of the ewes aborting annually. The disease is wholly confined to hill grazings and neither geological formation nor particular types of pasture appears to bear any relation to its occurrence.

A number of samples of serum from affected ewes were tested for the presence of agglutinins to *Vibrio fetus*, *Salmonella abortus-ovis* and *Brucella abortus*, but the results were negative. Moreover, a bacteriological examination of aborted foetuses failed to reveal any bacteria to which the condition could be attributed.

In view of the possibility that the disease might be due to environmental conditions a complete biochemical analysis was made of the blood of affected ewes and aphosphorosis was found in each case. Several field experiments were carried out in order to ascertain whether the disease could be prevented by feeding mineral, vitamin and protein-rich diets. It was found that the phosphate imbalance could be restored in this way, but there was no evidence that the abortion rate was reduced.—F. BLAKEMORE.

I. BOSWORTH, T. J. (1936). **Examination of Faeces and Urine of Cows for the Presence of** *Brucella abortus*.—*Rep. Inst. Anim. Path. Univ. Camb. 1934-1935.* pp. 72-78. 2 tables. [15 refs.]

II. BOSWORTH, T. J. (1936). **The Persistence of** *Brucella* **in the Aborted Foetus and its Membranes.**—*Ibid.* pp. 65-71. 1 table, 1 appendix. [13 refs.]

I. The urine (100 c.c.) and faeces (20 g. lots) of three reacting cows, which had aborted a few months previously, and in all of which *Br. abortus* was shown to be present in the milk, were repeatedly examined for *Br. abortus*.

The first cow gave negative results. In the case of the second the organism was recovered, twice from faeces and once from urine. This animal had not been in-calf for seven months and had been running in a yard away from access to gross source of infection, and, although certain other possibilities are discussed, is therefore believed to have been actually excreting the organism in urine and faeces. In the case of the third cow, *Br. abortus* was isolated once from the urine but reasons are given for believing that the animal may possibly have aborted unseen, although not known to have been in-calf, and that the infection of the urine may have thus originated. It is suggested that there is a case for further investigation of the possible importance of the dissemination of *Br. abortus* by way of faeces or urine.

In the examination of faeces, use was made of the method of Amoss and Poston, who added strong agglutinating serum to filtered faecal suspensions in order to concentrate the organisms. From some experiments made before com-

mencing the observations detailed above, B. gives data to show that injection of brucella antiserum into the guinea pigs, whilst not interfering with the detection of any but very small numbers of brucella, does delay the infection and subsequent development of blood agglutinins in the g. pigs.

II. Details are given of six experiments made at various times of the year, *viz*, four with foetuses and two with foetal membranes, all from cases of bov. cont. abortion which occurred at five to eight months. The infected specimens were placed in a grass field in a wire-netting, or in summer, in a gauze cage, partially shaded from the south and the west. Samples of material and the underlying soil were removed at intervals, triturated with sand and saline and inoculated into proved negative g. pigs which had been previously immunized with antisera protective against the common pathogenic clostridia.

Nine g. pigs were used for each sample ; they were inoculated subcutaneously, except at the beginning of the first experiment, when the oral and conjunctival routes were used and found unsatisfactory. G. pigs were killed four weeks later if showing high blood agglutination, otherwise eight weeks after inoculation, when blood agglutination tests and spleen cultures were made. The periods of survival in the different samples were 182, 147, 78, 134, 118, and 65 days respectively. The first two of these figures referred to experiments during the hot and dry summer of 1934.

No sample of material was regarded as positive unless *Br. abortus* was actually isolated from at least one g. pig.

B. concludes that pastures infected with *Br. abortus* cannot be regarded as safe for grazing healthy cattle until after the expiry of at least six months.—A. W. S.

I. United States of America. (1935). **Bang's Disease Control.** [Killham, B. J.]—*Rep. Div. vet. Sci. Mich., 1935.* pp. 15-23. 3 tables, 2 maps.

II. United States of America. (1935). **Report of Research Associate Huddleson [on Brucellosis].**—*Ibid.* pp. 34-41. 5 tables.

I. Owing to the introduction of the federal programme, it was not found possible to increase the number of demonstration herds to 400 as had been planned. There were, however, now 173 accredited herds, while only three herds which became accredited had become reinfected.

Following the lead of the City of Jackson, the City Council of Howell passed an ordinance which required a negative blood test for brucellosis for all cows supplying milk to the city : this action was taken after several people in the city had developed undulant fever.

In the compulsory tests in the Jackson County, of female cattle over one year old, 3,621 animals gave negative reactions, 292 gave doubtful reactions, and 469 gave positive reactions, while there were reactors in 44·2% of the herds.

II. H. reports the progress of the investigations on the production of immunity, by the injection of a strain of living avirulent *Brucella abortus* which does not give rise to agglutinins. Injections were made yearly over a period of five years. The first two injections were made subcutaneously after which the intradermal route was used.

Out of 1,723 head of cattle so vaccinated and exposed to natural infection, 356 became infected, as judged by the development and persistence of an adequate agglutination titre, or by the detection of brucella organisms in the milk or foetal material. Out of 732 controls, formed by negative animals in the same herds, 161 became infected over the same period.

From a mathematical point of view, the result shows a significant difference

in favour of the vaccinated animals. However, a higher degree of immunity will be necessary before this method can be considered to be a sufficient means of control, especially as certain animals fail to show immunity, measurable by the opsono-cytophagic method, even after two injections.—H. H. Holman.

Ruiz Martinez, C. (1936). Contribución experimental á la profilaxis del aborto epizootico del ganado bovino. [**Prevention of Bovine Contagious Abortion in Spain**].—*Trab. Inst. Biol. anim. Madr.* **4.** 128-201. 21 tables.

A dead vaccine " brucelon " [*V. B.* **5.** 794.] was used, three injections being given. Vaccinations in the provinces of Leon, Santander and Oviedo were carried out, but the revolt in the country interfered with the work in the latter province.

In Leon, the positive agglutinations were 32% in 254 sera examined and of 250 cows vaccinated 17 aborted, but trace of 57 cows had been lost. In Santander the positive agglutinations were 71% in the 487 sera examined and of the 470 cows vaccinated 58 aborted, but here again trace had been lost of 59 cows.

The author concludes that the strict isolation of affected or suspected animals with complete separation in stables and at pastures would be very difficult to carry out in these provinces and recommends vaccination.—A. H. Hunter.

Lasserre, R., & Labatut, R. (1937). La brucellose équine dans la région toulousaine. [**Equine Brucellosis around Toulouse**].—*Rev. Méd. vét., Toulouse.* **89.** 18-19.

A note of a few cases of purulent conditions in horses due to *Br. abortus*.
—E. J. Pullinger.

Berge, E., & Haupt, H. (1937). Ueber das Vorkommen Abortusbrucellose bei Pferden Mitteldeutschlands und ihre Bedeutung bei Widerrist- und Genickfisteln. [**Equine Brucellosis in Mid-Germany**].—*Berl. tierärztl. Wschr.* Feb. 12th. 97-100. 1 table. [Numerous refs.]

A report of the examination of 527 horses showing a variety of inflammatory lesions, and of 232 clinically healthy horses for brucella infection. Of the healthy group 43·5% showed either no agglutinins or titres below 1 : 25, 39·2% showed titres of 1 : 25, 14·7% showed titres of 1 : 50 and 2·6% titres above this level. Of the group showing inflammatory lesions 22% showed no agglutinins or titres below 1 : 25 and 55·6% titres of 1 : 25. The remaining 22·4% were considered to be infected with *Brucella* since 1 : 50 was taken as the critical titre. More than half of the 39 cases of fistulous withers were infected with *Brucella* but in other conditions this organism only appeared very occasionally as a chance infection.
—E. J. Pullinger.

Fitch, C. P., Bishop, Lucille M., & Kelly, Margaret D. (1936). **The Isolation of *Brucella abortus* from the Blood-Stream of Cattle.**—*Proc. Soc. exp. Biol., N.Y.* **34.** 696-698. 1 table. [8 refs.]

The authors conclude that a bacteriaemia is uncommon in cattle which have been long infected with *Br. abortus*, but may easily be detected in recently infected cattle, thus confirming the results obtained by Lubke [*V. B.* **5.** 695]. The acid citrate, heated citrate and sodium " polyanetholsulphonate " (liquoïde " Roche ") culture methods gave satisfactory results which were better than the cultivation of the clot or of whole uncitrated blood. The method successfully used by Soule, *viz*, bleeding 50 c.c. of blood into 450 c.c. of glycerol infusion broth, gave a large proportion of contaminated cultures.—A. W. Stableforth.

Sievert, Lena. (1936). Untersuchungen über den Antigenaufbau in der Brucellagruppe. [**Brucella Antigens**].—*Z. ImmunForsch.* **89.** 249-259. 9 tables. [8 refs.]

Using smooth but old stock strains of brucella, S. confirmed and elaborated the findings of Wilson and Miles on the antigenic structure of the *Brucella* genus. She stresses the need for careful quantitative absorption in the preparation of monospecific antisera, as in certain cases it is easy to absorb out all brucella antibodies. S. claims to have been able to absorb all antibodies from *melitensis* antiserum, using either the bovine or porcine strains of *abortus* as antigen, whilst *melitensis* antigen failed to absorb all antibodies against the other two.—E. J. P.

Nelson, J. B. (1937). **Infectious Catarrh of Mice. I. A Natural Outbreak of the Disease. II. The Detection and Isolation of Coccobacillary Bodies. III. The Etiological Significance of the Coccobacillary Bodies.**—*J. exp. Med.* **65.** 833-841, 843-849 and 851-860. 9 figs. on 2 plates, 6 tables. [11 refs.]

I. N. describes for the first time an outbreak of this disease in mice recently imported from Switzerland. The onset was slow, infectivity very high and death occurred in from 3 to 5 weeks of the first signs of the symptoms. Some mice developed a more chronic disease but eventually succumbed with typical symptoms. A rhinitis without discharge was generally present as the first symptom, but a chattering sound, likened to gentle clicking of teeth and apparently produced in the lower part of the respiratory tract, sometimes accompanied the rhinitis. The chattering gradually became more distinct and less intermittent. Snuffling occurred. There was an involvement of the middle ear and lungs, death being due to pneumonia of slow progression.

II. Small Gram-negative coccobacilliform bodies resembling those of fowl coryza were always found either free or intracellularly in the nasal and middle ear exudate of naturally and experimentally infected mice. They were isolated and grew in tissue cultures, but no multiplication occurred in ordinary blood-enriched nutrient culture media. The size was found to be less than 0·64μ by collodion filtration and between 0·3μ and 0·4μ by staining methods. A second organism similar to the X bacillus of fowl coryza and which grew in blood-enriched culture media in the form of compact clumps was also isolated from infected mice. Both types of organism are illustrated by photomicrographs.

III. Experiments showed that the coccobacillary bodies were the infective agent. Primary tissue cultures of these organisms were always pathogenic, but the presence of any X bacilli rendered later tissue culture transfers non-infective. If in pure culture, they remained infective through 12 transfers at intervals of 2 or 3 days. Coarse Berkefeld filtrates were innocuous.

Experimentally produced disease was less severe than natural disease and the symptoms and lesions were not all invariably produced. Unless the upper respiratory tract was affected the disease could not be transmitted by contact. In one diseased colony of mice the incidence of the disease was irregular and the author considers that this was due to the absence of rhinitis in the affected individuals.

—C. V. Watkins.

Nelson, J. B. (1936). **Studies on an Uncomplicated Coryza of the Domestic Fowl. V. A Coryza of Slow Onset. VI. Coccobacilliform Bodies in Birds Infected with the Coryza of Slow Onset. VII. Cultivation of the Coccobacilliform Bodies in Fertile Eggs and in Tissue Cultures. VIII. The Infectivity of Fetal Membrane and Tissue Culture Suspensions of the Cocco-**

bacilliform Bodies.—*J. exp. Med.* **63.** 509-513, 515-522, **64.** 749-758 and 759-769. 8 figs. on 2 plates, 9 tables. [13 refs.] [See also *V. B.* **5.** 602].

V. Two forms of coryza are considered in which the only appreciable difference is in the length of the incubation period. In one (coryza of rapid onset) the incubation period is never more than three days, while in the other (coryza of slow onset) it is never less than nine days.

In bacteriological examinations *Haemophilus gallinarum* was isolated from all cases of coryza of rapid onset and was constantly absent in cases of coryza of slow onset. In these latter cases the bacteriological findings varied, consisting either of the normal flora of the upper respiratory tract or of no growth.

VI. Such bacteria as could be readily cultured were found to fall into three groups. They showed no uniformity in their appearance and were few in number in the lesions in the earlier stages, becoming very numerous later. All were put down as secondary invaders. Among those seen was a small Gram-negative organism obtained in some cases in the fluid portion of blood-agar slants. It could be cultivated in liquid medium and, after repeated transfers, on plates. It was found to be innocuous. Attempts to reproduce the disease by the inoculation of filtered exudate also failed.

Minute coccobacilliform bodies morphologically similar to the Gram-negative bacilli already mentioned were frequently observed microscopically in films of exudate, but all attempts at cultivation on ordinary media failed.

VII. N. has cultivated the coccobacilliform bodies found present in the exudate of coryza of slow onset by the egg membrane method of Woodruff and Goodpasture and by the tissue culture method of Li and Rivers.

Using the egg membrane method he was unsuccessful when inoculation was made in eggs on the tenth day of incubation but succeeded when it was done on the fourth day, when approximately 50% of eggs inoculated showed the presence of the bodies in the membranes. In no case were they found in the embryo. The number of attempts at tissue culture is not given, but two isolations were made and both have been successfully subcultured at intervals of 24-72 hours for a considerable period.

VIII. Intranasal inoculations of foetal membrane and of tissue culture suspensions of coccobacilliform bodies resulted in the production of coryza in 22 cases out of 24 and in 20 out of 20 respectively. In approximately half the number, however, no symptoms were shown and the condition was diagnosed at *post-mortem* examination.

Inoculation of exudate from artificially infected birds also resulted in coryza and here again in a considerable number of cases the condition was not apparent during life.—W. J. Ironside.

Frei, W. (1936). Allgemeine Biologie der anaeroben Bakterien und allgemeine und vergleichende Pathologie der Anaerobenkrankheiten. [**Biology of Anaerobic Bacteria and Pathology of Anaerobic Diseases**].—*Ergebn. allg. Path. path. Anat.* **31.** 1-200. 26 tables. [Numerous refs.]

This publication, in which reference is made to about 400 original articles and 40 standard text-books, constitutes the most comprehensive and up-to-date review of the subjects at present available, and in particular is recommended to those interested in the biology of anaerobic bacteria. At the same time it should be realized that certain sections, particularly those dealing with bacterial metabolism, are extremely technical in character and are likely to be of little value to readers who are unfamiliar with the language (German) or with the modern concepts and terminology of the subject. The term " anaerobic " is used in its widest sense to

encompass not only the obligatory anaerobes, but also the facultative and microaerophilic ones, whilst for comparative purposes the strongly aerobic organisms come under consideration as well.

Under the heading of habitat the occurrence of anaerobes in soil, plant and animal products, and in the animal body is discussed. Under cultivation methods are not only a discussion of the alterations of gas tension and the introduction of reducing systems into the culture medium, but also a consideration of the whole significance of oxidation-reduction potentials. There follow about 60 pages dealing with bacterial metabolism including the method of utilization of proteins, carbohydrates and fats, a consideration of the various respiratory systems and the role played by certain respiratory pigments and enzymes, and further mention of certain waste products of bacterial metabolism.

The remainder of the publication is devoted more directly to the disease-producing properties of the anaerobes. Following a discussion of the significance of toxins and the resistance of organisms to unfavourable environments, there are chapters on the pathogenesis of anaerobes, the toxicology of their products, and the comparative pathology and epidemiology of the various anaerobic infections.

The foregoing survey should give some idea of the extremely valuable task which Prof. Frei has performed in collecting and co-ordinating the results of numerous research workers in so many diverse fields.—E. J. Pullinger.

I. Miessner, H., & Schoop, G. (1936). Die Stellung des Rauschbrandes unter den Gasödemen. [**Blackleg as a Gas Oedema Disease**]. —*3rd int. Congr. comp. Path. 1936.* **1.** Pt. 1. Vet. Sect. 81-102. [Numerous refs.] [In German : French summary].

II. Ananiadés, B., & Dèbonera, G. (1936). Rapport général sur les maladies dues aux anaérobies chez les animaux domestiques. [**Anaerobic Diseases of Domestic Animals**].—*Ibid.* 103-118. Discussion **2.** 422-423. [In French].

III. Weinberg, M. (1936). Le B. perfringens en pathologie animale. [*Clostridium welchii* **in Animal Pathology**].—*Ibid.* **2.** 406-421. 1 table. [In French].

IV. Dungal, N. (1936). **Braxy in Iceland.**—*Ibid.* **1.** Pt. 1. Vet. Sect. 69-80. 1 table. [In English : French summary].

V. Greig, J. R. (1936). **Braxy.**—*Ibid.* **2.** 424-426. [In English].

I. A review of the veterinary problem of gas gangrene with special reference to its bacteriology and control. No new information is reported. In particular *Cl. chauvoei*, *Cl. oedematiens*, and *Cl. septique* infections of cattle and sheep were discussed.

II. A superficial discussion of clostridium and fusiformis infections under the headings (a) external trauma, (b) internal trauma, (c) toxins, and (d) genus *Fusiformis*. No new information is reported.

III. Review of recent work on *Cl. welchii* with special reference to that of Wilsdon, of Glenny, Dalling and co-workers, and of Borthwick. There follows a recapitulation of the author's own work upon the multiplicity of toxin and overlapping of toxin types produced by different strains of *Cl. welchii*.

IV. A survey of braxy as it occurs in Iceland. No new information is recorded and D. emphasizes the difficulty in indicating any feasible hypothesis with regard to the nature of the secondary factor which stimulates the onset of disease.

V. Supported by a small amount of experimental evidence, the suggestion is advanced that the onset of braxy may depend upon changes of pH of the abomasal content from the highly acid normal level towards neutrality. A report

is made of satisfactory prophylaxis following the use of formolized whole culture. —E. J. PULLINGER.

BREED, F. (1937). **A Study of Blackleg and its Complications.**—*J. Amer. vet. med. Ass.* **90.** 521-528. 3 tables. [6 refs.]

Blackleg in the field is occasionally caused by *Cl. septique*, and in a few instances by *Cl. novyi*. It is impossible to distinguish such infections clinically from true blackleg caused by *Cl. chauvoei*. Experiments confirm that the usual commercial blackleg products will give efficient protection against *Cl. chauvoei*, but not against *Cl. septique* either alone or combined with *Cl. chauvoei*. A special *chauvoei-septique* bacterin in 5 c.c. doses protected lambs against a combined infection with *Cl. chauvoei* and *Cl. septique*.—R. FISHER.

DISEASES CAUSED BY PROTOZOAN PARASITES.

ADAMS, A. R. D. (1936). **Trypanosomiasis of Stock in Mauritius. III. – The Diagnosis and Course of Untreated T. vivax Infections in Domestic Animals.**—*Ann. trop. Med. Parasit.* **30.** 521-531. 3 tables. [7 refs.] [See also *V. B.* **6.** 413].

A. records observations on goats, sheep and cattle experimentally infected with 2 strains of *Tryp. vivax* recovered from naturally infected cattle in Mauritius. Four sheep all died within 2 months of infection. Out of 9 goats, 7 died in periods varying from 2 weeks to a month and the other 2 died later, apparently from other causes. Six cattle all made apparent recoveries from infection, but one animal which broke its leg about 9 months after apparent recovery showed a recurrence of the trypanosome infection of the blood. Attempts to produce superinfection of recovered cattle were unsuccessful. Pigs and small laboratory animals were not susceptible to infection.

Gland puncture did not prove more reliable than blood examination in the diagnosis of infection, but in cattle trypanosomes were detected 24 to 48 hours earlier in gland juices than in peripheral blood.—U. F. RICHARDSON.

GRIMPRET, J. (1937). La theilériose bovine au Maroc. [**Bovine Theileriasis in Morocco**].—*Maroc méd.* **17.** 22-28.

Piroplasmosis is the cause of considerable mortality in imported cattle. A high percentage of indigenous adult animals have passed through the disease and are in a state of premunition. Any lowering of bodily resistance results in a disturbance in the equilibrium and the disease becomes active. In Morocco the first vaccination against anthrax appears to be one of the main causes of this lowering of resistance. Relapses occur no matter how the state of premunition is acquired. Imported animals are perhaps more susceptible, although the fact that they are usually adult when imported is a factor to be considered. Infection when young undoubtedly results in a milder attack, although fatal cases do occur in calves. The disease occurs throughout the year but mainly in the summer months when there may be a lowered resistance due to diet deficiencies and anthrax vaccination. A comparison is made between treatment with " gonacrine " and with " zothelone " and it is shown that while the former is a specific the latter is purely an anti-pyretic.—F. H. MANLEY.

BOUGHTON, D. C. (1937). **Studies on Oöcyst Production in Avian Coccidiosis. I. Dilution Count Technique. II. Chronic Isosporan Infections in the Sparrow.**—*Amer. J. Hyg.* **25.** 187-202 and 203-220. 9 tables. [Num. refs.]

I. In cases of coccidiosis a counting technique is of value in determining, amongst other things, diurnal periodicity in oocyst production and low level infection. The method discussed in this paper was evolved for the enumeration of oocysts in dried faecal samples from small birds. The material was obtained from sparrows (*Passer domesticus*) infected with *Isospora* and additional counts were made on eimerian oocysts (probably *E. labbeana*) from the domestic pigeon (*Columba* sp.). Droppings were collected on pieces of oiled paper from birds in specially designed cages. The faeces, separated from waste matter [a simple process when using dried samples], were weighed to nearest tenth of a gramme, placed in a counting bottle and covered with 5 or 10 c.c. N/10 NaOH, and left to soak for from three to twelve hours when sufficient N/10 NaOH was added to bring the dilution to 1 g. dried faeces in total volume of 120 c.c. The whole was then shaken and allowed to stand for from 12 to 18 hours after which the oocysts in a representative sample of 0·075 c.c. were counted directly. The total number of oocysts is obtained as follows :– 1,600 × count × weight of faeces in g. Single ounts demonstrated the various levels of oocyst production met with in natural and experimental infections. N/10 NaOH restores the normal shape of desiccated oocysts, thus simplifying counting ; they are also evenly distributed in contrast to the clumping which so frequently happens when a water medium is used.

II. The high degree of parasitism by *Isospora* in the sparrow, considered in the light of Tyzzer's belief that in eimerian species a single infection is self-limited, means first, that the sparrow must be constantly in touch with infective material, and secondly, that very little, if any, immunity is acquired to subsequent infection. The present paper deals with the determination of the important factor responsible for the maintenance of *Isospora* infection within the host. Oocyst production of *Isospora* under various laboratory conditions, and with experimental inoculations, was studied by oocyst counts as described in I. It would appear that there is prolonged chronic infection in hosts isolated from infective material. Also, by inoculation, infection can be superimposed upon an existing chronic infection and, further, if a host has been previously infected, a second experimentally induced infection can be established. A sharp rise in oocyst production was observed on the tenth day following a superimposed infection. The normal peak time (3 p.m.-9 p.m.) is independent of the time of the responsible inoculation.—C. H.-S.

Tyzzer, E. E. (1936). **A Study of the Immunity Produced by Infection with Attenuated Culture-Strains of** *Histomonas meleagridis*.—*J. comp. Path.* **49.** 285-303. 4 tables. [4 refs.]

T. carried out immunity tests for blackhead in young chickens and turkeys, using 5 strains of the parasites maintained for varying periods up to 5 years in a special culture medium at 37·5°C. He found that the pathogenicity of the parasites was thereby greatly, but not uniformly, reduced, and that any non-pathogenic culture strains possessed transient but well-marked immunizing properties against recently isolated virulent strains. These properties were gradually lost in the course of cultivation.

In birds which appeared to be completely immune as judged by macroscopical appearances *post mortem*, no invasion of the tissues by the parasites could be determined microscopically. In partially immunized chickens the variation of the reaction to these culture strains compared with the reaction in controls included a shorter period of infection, delayed infections occasionally and a restriction of the area of caecal wall invaded by the parasites, the difference in the histological changes produced being one of degree only.

One recently isolated strain from a spontaneous case of blackhead proved to

be comparatively avirulent. Otherwise all infective material derived from naturally diseased birds was regularly pathogenic as also were embryonated *Heterakis gallinae* eggs by the oral route.

Serial passage of a culture strain of *Histomonas* through turkeys and young chickens did not regain the pathogenicity lost by culture [see *V. B.* **5.** 341]. —C. V. Watkins.

Herman, C. M. (1937). **Toxoplasma in North American Birds and Attempted Transmission to Canaries and Chickens.**—*Amer. J. Hyg.* **25.** 303-312. 17 figs. on 1 plate. [Numerous refs.]

Toxoplasma has been found in at least twelve families of birds. H. observed it in English sparrows (*Passer domesticus*), starlings (*Sturmus vulgaris*), canaries (*Serinus canarius*), and other birds, in which the greatest numbers were found in the spleen and liver. In heavy infections the lungs were also parasitized as well as bone-marrow, heart-blood and intestines. Mortality was high in severe cases. Previous investigators have claimed success in transferring *Toxoplasma* from one host to another, but H. has been unable to effect such transmission and suggests that there are strains differing in transmissibility and host-specificity. Attempts were made to transmit infection from English sparrows to canaries by direct blood inoculation, the injection of mites which had lived on sparrows, and by feeding fully-fed mites to canaries as well as by the injection of macerated sparrow tissues. The results were negative in each case. Similarly, no definite infection was obtained in domestic chickens. H. suggests that only one species of *Toxoplasma* lives in birds, and that this is *T. paddae* which may be synonymous with *T. gondi*. —C. Horton-Smith.

Durant, A. J. (1937). **Infectious Enterohepatitis.**—*J. Amer. vet. med. Ass.* **90.** 596-607. 2 figs. [7 refs.]

This is a general description of infectious enterohepatitis. The characteristics of the parasite, *Histomonas meleagridis*, the symptoms and course of the disease, the *post-mortem* lesions, and the control measures to be adopted in an infected flock are clearly described. *Heterakis gallinae*, the caecal worm, has definitely been established as an invertebrate host of *Histomonas meleagridis* and turkeys seldom contract blackhead in the absence of the caecal worm.—R. F. Gordon.

I. Donatien, A., & Lestoquard, F. (1936). Recherches sur *Rickettsia canis* comparaison avec *Rickettsia conori*. [**Comparison of** *R. canis* **with** *R. conori*]. —*Bull. Soc. Path. exot.* **29.** 1052-1056. [1 ref.]

II. Donatien, A., & Lestoquard, F. (1936). *Rickettsia bovis*, nouvelle espèce pathogène pour le boeuf. [*R. bovis*. **New Pathogenic Species for Cattle**]. —*Ibid.* 1057-1061. [2 refs.]

III. Donatien, A., & Lestoquard, F. (1937). Existence de *Rickettsia conjunctivae* du mouton Coles 1931 en Algérie. [*R. conjunctivae* **Coles, 1931 in Sheep in Algeria**].—*Ibid.* **30.** 18-20.

I. Observations on dogs that had received experimental inoculations of ground-up ticks point to *Rhipicephalus sanguineus* as the vector of the sporozoan, *Rickettsia canis*. The protozoan was only found in some circulating monocytes, and never in fixed cells. Dogs infected with leishmaniasis are particularly susceptible to natural rickettsiasis. An acute attack of piroplasmosis aggravates the severity of rickettsiasis while the latter in acute form is capable of awakening a latent infection with *Babesia canis*. *Rickettsia canis* is not restricted to Algeria but also occurs along the Mediterranean coast of France. It is shown that *Rickettsia canis* and *Rickettsia conori* are distinct species.

II. By experimental methods D. and L. were led to conclude that a *Rickettsia*, transmitted by a tick of the genus *Hyalomma*, from Iran, was pathogenic to cattle. They named this *R. bovis*. Examination of the organic troubles provoked by this organism revealed enlargement of the spleen and lymph nodes. The organism was seen in large numbers in the lung : it also occurs in the kidneys, capillary blood, liver, spleen, peripheral blood, lymph nodes, suprarenal capsules, myocardium and skin ; it is absent from bone-marrow, brain, testicle, vagina and from the walls of the blood vessels. These *Rickettsia* are variable in size – the largest range from 6-11μ, the smallest from 1-2μ, in diameter.

III. In February, 1936, D. and L. ascertained the existence of an ocular affection in Algerian sheep. Giemsa-stained preparations of inflamed conjunctiva showed the presence of a *Rickettsia*, analogous to *R. conjunctivae*, Coles, 1931, and it was found in a number of cases. Diagnosis is simple and rests on the verification of the conjunctivitis in a large number of sheep from the same flock. *R. conjunctivae* is sometimes so abundant that the whole cytoplasm of the epithelial cells is occupied. In natural conditions transmission of parasites from animal to animal is easily explained. In the markets the animals, secured by the head, are placed side by side so that there is ready contact between sick and healthy individuals. At pasture, sheep are commonly crowded and sneezing conveys the parasite from host to host. The disease is widely spread in Algeria at certain seasons.—C. H.-S.

DISEASES CAUSED BY VIRUSES.

I. Rivers, T. M. (1936). **Viruses and the Diseases caused by them.**—*Ann. intern. Med.* **9.** 1466-1474. [Numerous refs.]

II. Rivers, T. M. (1936). **Recent Advances in the Study of Viruses and Viral Diseases.**—*J. Amer. med. Ass.* **107.** 206-210. [Numerous refs.]

I. The nature of viruses is discussed and the character of the lesions produced by them. The treatment of virus diseases by the use of vaccines and immune or convalescent sera is described. The inability of immune serum to inactivate a virus after the generalization of the virus throughout the tissues has been well shown in certain experiments.

II. Recent work upon virus diseases of the central nervous system in man is described in some detail, particular attention being paid to epidemic encephalitis. The intranasal instillation of substances such as alum is shown to be effective in preventing the infection of mice with equine encephalitis virus. It is assumed that such neurotropic viruses may gain entry by the olfactory nerve.—E. C. Hulse.

Burnet, F. M. (1936). **The Use of the Developing Egg in Virus Research.**—*Spec. Rep. Ser. med. Res. Coun., Lond.* No. 220. pp. 58. 3 text figs., 8 figs. on 2 plates, 4 tables. [Numerous refs.]

A detailed description is given of the technique of chorio-allantoic membrane inoculation and of the method of examination of the developed lesions.

This method of virus culture is of value in obtaining quantities of bacteria-free material for experimental purposes and in performing virus titrations. Similarly, the virus-inactivating properties of immune sera may be studied. The technique is applicable as a diagnostic agent in the differentiation of certain viruses, such as those of F. & M. disease and vesicular stomatitis.

Lesions develop in the ectodermal cells of the chorio-allantoic membrane, the infection spreading centrifugally from the damaged cells. In most cases, necrosis and degeneration occur ; in vaccinia and infectious laryngotracheitis, a crater-

shaped " pock " develops. The character of the lesions is modified by the age of the embryo at the time of inoculation and the temperature at which the egg is subsequently incubated.

Virus titration is performed either by observation of the lethal effect of certain viruses upon the embryo or in the case of the pox viruses by counting the pock-lesions or foci on the membrane.

Fowl Pox.—No necrosis of the ectodermal cells and little inflammatory reaction. Cytoplasmic inclusions (Bollinger bodies) are demonstrable. The virus retains its pathogenicity for the fowl after repeated egg passage.

Infectious Laryngotracheitis.—Lesions resemble closely those of vaccinia. Inclusion bodies are present in almost every infected cell.

Fowl Plague.—The virus is rapidly lethal for the embryo, death occurring within 24 hours after inoculation. Virus is demonstrable in all parts of the embryo.

Newcastle Disease.—Death of the embryo occurs in 24 to 48 hours after inoculation ; a characteristic lesion is the development of haemorrhages in the developing feather follicles. Infected membranes show necrosis of the ectoderm and haemorrhage and oedema of the mesoderm.

Vesicular Stomatitis and Equine Encephalomyelitis.—Both viruses are lethal for the embryo ; no inclusion bodies are seen.

" Louping Ill ".—The virus generalizes throughout the embryonic tissue and necrosis of the liver may occur.

Psittacosis.—Egg passage has been performed, the pathogenicity of the virus for mice remaining unchanged for 14 passages.

Bovine Contagious Pleuro-pneumonia.—Although the organism is capable of growth on the membrane, the characteristic proliferative ectodermal lesions of true viruses are not observed.—E. C. Hulse.

Köbe, K. (1937). Vergleichende Untersuchungen über die pneumotropen Virusarten und die durch sie bedingten Krankheiten bei Mensch und Tier. [**Pneumotropic Virus Diseases in Man and Animals**].—*Arch. wiss. prakt. Tierheilk.* **71.** 149-181. [Numerous refs.]

A review article summarizing the present-day knowledge of the following pulmonary diseases :- swine influenza, piglet influenza, infectious equine bronchitis, infectious bovine bronchitis, equine influenza and canine distemper. Abstracts of the essential information have already appeared in this *Bulletin*. In the second section of the publication K. discusses the significance of the pneumotropic viruses, including that of human influenza, and compares them one with another.—E. J. P.

Schmidt, W. (1936). Ueber das Vorkommen von Herzveränderungen bei der Maul- und Klauenseuche des Meerschweinchens. [**Heart Lesions in Foot and Mouth Disease in G. Pigs**].—*Z. InfektKr. Haustiere.* **49.** 208-213. 3 figs. [10 refs.]

The occurrence of myocardial lesions in g. pigs infected with the virus of foot and mouth disease has been denied by some workers. Others have recorded lesions but have not conclusively shown them to be due to the virus.

S. found that myocardial lesions occur in about 2·7% of infected g. pigs. The left side of the heart is more often affected than the right. The lesions are primarily degenerative in character but there occurs a secondary inflammatory reaction.

In young g. pigs (three to five weeks old) infected cutaneously with a highly virulent strain of the virus, the incidence of heart lesions was considerably higher – 19 out of 22 animals dying within two to five days of inoculation. On *post-*

mortem examination no bacteria were isolated from the myocardium in 16 animals, and in six of the seven animals in which the heart muscle was tested for the presence of the virus a positive result was obtained.—E. G. White.

MacLeod, J. (1936). **Studies on Tick-Borne Fever of Sheep. II. Experiments on Transmission and Distribution of the Disease.**—*Parasitology*. **28.** 320-329. 3 tables. [11 refs.] [See also *V. B.* **4.** 106].

Female *Ixodes ricinus* ticks fed on a sheep infected with tick-borne fever do not transmit the infective agency to their progeny, *i.e.*, the virus does not pass through the egg. Infective females may have acquired infection as nymphs or as larvae, and if unfed would appear to retain infection up to approximately 14 months. They become infective as soon after moulting to the next stage as they are able to attach themselves to a host, infection being transmitted to the sheep in the course of the second day. The disease is transmissible to sheep by the inoculation of emulsions of infective ticks, and it was found that infection was more certain if the ticks were partially engorged and emulsified in serum. The use of saline as an emulsifying agent would appear to be contra-indicated.

The author examined ticks from several areas in the Grampians and southern Scotland and suspects that tick-borne fever may be prevalent on all the hill land in Scotland where ticks are found.—A. Wilson Taylor.

Toussieng, M. E. (1936). Immunisation active des bovidés contre la fièvre aphteuse au moyen d'adsorbats d'aluminium. [**Active Immunization against Foot and Mouth Disease by Aluminium Adsorbates**].—*Bull. Off. internat. Epiz.* **13.** 417-444. 7 tables, 1 photograph. [1 ref.]

A series of experiments on large animals to obtain active immunization by the use of a vaccine prepared from aluminium adsorbates.

For the preparation of the vaccine, virus from g. pigs was cultivated *in vitro* by Frenkel's method, and samples of virus were also obtained from bovine and swine lesions.

Eleven bovines, aged from one to one and a half years, were vaccinated twice at an interval of ten days. Three additional animals were vaccinated twice with 0·1% formolized vaccine at an interval of four days.

Two of the bovines which were inoculated with $Al_2(OH)_6$ adsorbate vaccine showed generalized lesions after the preliminary inoculation. During the course of the experiment, the serum of the vaccinated animals was examined for the presence of antibodies by g. pig titration. The vaccinated cattle were exposed to contact infection three weeks after the second inoculation. Generalized lesions were shown by six animals; of these susceptible bovines, two had received formolized vaccine. Those animals which were insusceptible to contact infection were inoculated intradermally into the mucous membrane of the tongue three weeks later. Of these, four were shown to be resistant to infection by inoculation; primary lesions were seen in the remaining two animals and generalization occurred in one of them. Control bovines developed typical F. & M. disease. One immune bovine was reinoculated after a further period of seven weeks and it was found to be completely resistant to infection.—E. C. Hulse.

I. Poppe, K., & Busch, G. (1936). Zur Frage der Symbiose des Virus der Maul- und Klauenseuche in pflanzlichen Mikroorganismen. [**The Symbiosis of Foot and Mouth Disease Virus with Bacteria**].—*Zlb. Bakt. I.* (*Orig.*). **136.** 385-389. 3 tables. [11 refs.]

II. Borchla, J. (1936). Die Züchtung des Maul- und Klauenseuchevirus in

Gewebekulturen auf Zellophanmembranen. [**The Culture of Foot and Mouth Disease Virus in Tissue Cultures on Cellophane Membranes**].—*Ibid.* 389-394. 1 fig., 3 graphs. [12 refs.]

III. Köbe, K., & Fertig, H. (1936). Die Züchtung des Maul- und Klauenseuchevirus in Reinkulturen von Epithelzellen und Fibroblasten. [**The Culture of Foot and Mouth Disease Virus in Pure Cultures of Epithelial Cells and Fibroblasts**].—*Ibid.* **138.** 14-20. 1 fig., 1 table. [8 refs.]

I. Virus filtrate diluted in broth was inoculated with certain yeasts, moulds, and bacteria and was incubated at room temperature in the dark. In the presence of certain yeasts and other fungi the virus survived a few days whereas it died in the same medium if yeast cells were not present. The virus appeared to be adsorbed on to the yeast cells.

II. Apparatus and technique are described for growing foot and mouth disease virus on a plasma clot suspended on a cellophane membrane over tyrode solution. In this apparatus virus survived upwards of 70 subcultures and titres were recorded 10 to 100 times higher than those obtained in tube cultures. The highest titre was attained after 20 to 50 hours' incubation at 37°C.

III. The virus of F. & M. disease survived more readily in pure tissue-cultures of epithelial cells than in fragments of " whole skin ", and in fibroblast cultures the virus died out rapidly. A number of the epithelial cells containing virus underwent degeneration. Considerable fluctuations of the titre of the virus were seen in such tissue culture.—E. J. Pullinger.

Hecke, F. (1937). Das Virusproblem bei Maul- und Klauenseuche. [**The Virus Problem in Foot and Mouth Disease**].—*Z. InfektKr. Haustiere.* **50.** 250-297. 2 tables.

A lengthy recapitulation, unsuitable for abstraction, of the present-day knowledge of the virus of F. & M. disease ; also comparisons of this virus with others, including those which stimulate the development of new growths.—E. J. P.

Leclainche, X., & Verge, J. (1936). Maladie des porchers grippe humaine et grippe porcine. [**Swineherds' Disease, Human and Porcine Influenza**].—*Mouvem. sanit.* **13.** 549-559. [Numerous refs.]

L. and V. give an exact clinical description of swineherds' disease in man and discuss the cause on the basis of a theory that it may be a human infection with swine influenza, quoting the work of Shope and others on experimental cross-immunity between human and porcine influenza. [No evidence is provided concerning the actual disease of pigs associated with swineherds' disease, so any such theory as that discussed by the authors is purely speculative—see *V. B.* **7.** 218].—J. E.

Pawan, J. L. (1936). **Rabies in the Vampire Bat of Trinidad with Special Reference to the Clinical Course and the Latency of Infection.**—*Ann. trop. Med. Parasit.* **30.** 401-422. 1 table. [6 refs.]

In this further work on paralytic rabies in Trinidad [see *V. B.* **6.** 867.] observations show that the vampire bat is susceptible to artificial infection. Following either natural or artificial infection the resultant disease may be of the furious or paralytic type, or the bat may exhibit no symptoms. The vampire bat may also appear to recover from the furious or paralytic type. Bats that have apparently recovered become carriers and can spread the disease by their bites for periods exceeding three months.—R. Fisher.

Anon. (1937). **Report of Committee on Rabies [U.S. Live Stock Sanit. Ass.]**—*J. Amer. vet. med. Ass.* **90.** 408-418.

The Committee first give a historical review of the disease. A questionnaire was sent to all states requesting information on the rabies situation, and 45 states replied. From the information given it appears that rabies is wide-spread in approximately 75% of the states. Tourists' dogs and dogs accompanying workers are accused of being the source of infection in a number of outbreaks. Rabies occurs during every month of the year. In Texas, the highest average for a five-year period occurred in January and February, and the lowest in June and August. Early diagnosis is essential, followed by the destruction of rabid animals and stray dogs, and the isolation and vaccination of bitten dogs. The normal incidence does not justify compulsory vaccination. The Committee consider that rabies can be eliminated from most areas by quarantine and sanitary police measures alone. No statement is issued on the single-dose vaccine.—R. Fisher.

I. Remlinger, P., & Bailly, J. (1936). La vaccination des animaux contre la maladie d'Aujeszky est-elle possible ? [**Vaccination against Aujeszky's Disease**].—*Bull. Acad. vét. Fr.* **9.** 428-431. [6 refs.]

II. Remlinger, P., & Bailly, J. (1937). La mort la nuit dans la maladie d'Aujeszky. [**Death in the Night from Aujeszky's Disease**].—*Maroc méd.* **17.** 111-112.

III. Remlinger, P., & Bailly, J. (1937). Existence de régions avirulentes dans le système nerveux central des animaux morts de la maladie d'Aujeszky. [**Avirulent Regions in the Nervous System of Animals Dead of Aujeszky's Disease**].—*C. R. Soc. Biol. Paris.* **124.** 326-329. [1 ref.]

IV. Rossi, P. (1937). L'urée sanguine chez les bovins atteints de maladie d'Aujeszky. [**The Blood Urea of Cattle affected with Aujeszky's Disease**].—*Ibid.* 706-707. [1 ref.]

I. The results of attempted vaccination against Aujeszky's disease have so far been disappointing. A vaccine was prepared by the admixture of a suspension of virulent rabbit or dog brain and sodium ricinoleate solution. Dogs and cats were inoculated (subcut.) in repeated doses with this vaccine ; some of the animals succumbed to the infection during the course of vaccination and others were subsequently proved to be susceptible. The difficulty experienced in obtaining a vaccine is an important difference from rabies.

II. It has been found that 60% of animals succumbing to Aujeszky's disease die during the night. The night to day death rate for infected dogs is 4 : 1, and for rabbits 2 : 1.

III. During the course of the passage of the virus of Aujeszky's disease in rabbits, it sometimes happens that no symptoms arise from the inoculation of apparently virulent material. The occurrence of avirulent zones in the central nervous system of animals infected with this virus is common. Virus is rarely found in the lumbar portion of the spinal cords of dogs inoculated subdurally or into the anterior chamber of the eye.

IV. A rapid rise in the blood urea content is encountered in cattle affected with pseudorabies. The normal blood urea content of young cattle is 0·33 g. per litre ; the blood of affected animals contains up to 0·819 g. per litre. The excretion of urea in the urine is unchanged.—E. C. Hulse.

Tanon, L., & Cambessédès, H. (1936). Le rôle des animaux dans la transmission de la poliomyélite. [**The Transmission of Poliomyelitis by Animals**].—*Ann. Hyg. publ., Paris.* **14.** 562-569. [1 ref.] [Copied *verbatim* from *Bull. Hyg., Lond.* **12.** 110. Signed A. J. Collis].

It has been found experimentally that the only animal which can be infected with poliomyelitis is the monkey, but the authors have recently met with some cases which seem to show that the infection can be carried by birds and animals.

A child aged 4 years lived with its parents on the outskirts of a town quite isolated from other houses, did not attend school or see other children and did not leave the house except to play in a yard where there was an aviary. A few weeks before the child had a definite attack of poliomyelitis there had been an epidemic among the birds in the aviary and several died. The authors were unable to obtain a dead bird for examination.

A child aged 10 years had a few days before the onset of poliomyelitis picked up a dead turtle dove and hugged it.

A child five days before the onset of the disease had taken care of a sick jay which died.

An infant of 11 months was brought to hospital from a village where there had been two other cases of poliomyelitis. There had been at a farm in the village a severe epidemic among fowls and twelve had died. It was noted that their walking was affected.

A child aged 4 years had played with a dead bird a few days before the onset of the disease.

A hospital patient aged 17 years with poliomyelitis stated that the fowls at home were affected with paralysis.

Two cases of poliomyelitis seemed to have had some connection with a cat. Two brothers aged 3 and 4 years had before the onset of the disease assisted in cleaning vermin from a cat which had come from a house where a child had died of poliomyelitis.

The authors raise the question whether these cases are all coincidences and ask their colleagues to aid in the solution of the problem.

Kinsley, A. T. (1937). **Swine Flu.**—*Vet. Med.* **32.** 148-149. 1 fig., 1 photograph.

Swine influenza is prevalent throughout America and, although mortality is low, its economic importance is high owing to its extreme infectiousness and the rapid loss of condition which results. Severe losses also occur among the piglets of sows infected during pregnancy. Pig lungworm disease and haemorrhagic septicaemia must be remembered for differential diagnosis. This is a complex virus-bacillary disease and K. discounts the use of virus for immunizing purposes and recommends good hygiene. Bacterins against haemorrhagic septicaemia and pulmonary oedema may be tried to ward off secondary infections.—C. V. Watkins.

I. Blakemore, F., & Glover, R. E. (1937). **Variola in the Pig.**—*Vet. Rec.* **49.** 750-752. 2 figs. [6 refs.]

II. Murray, C. (1937). **Swine Pox.**—*J. Amer. vet. med. Ass.* **90.** 326-331.

III. Kinsley, A. T. (1937). **Swine-Pox** (*Variola suilla*).—*Vet. Med.* **32.** 147.

I. B. and G. describe an outbreak of a pox-like condition of pigs in East Anglia. Young pigs between 3 and 6 weeks old were chiefly affected, but some store pigs also developed the disease and a few sows had lesions on their teats. Some dulness and inappetence were the first symptoms. The lesions were not particularly pox-like, an erythematous stage of short duration, with areas affected up to half an inch in diameter and rarely coalescing, being followed by scab formation without vesicle or pustule formation. Later some areas became circumscribed by fibrous tissue which raised their borders and produced a crater-like appearance. Two photographs illustrate these lesions. The duration of the disease was about three

weeks. Loss of condition was the only prominent symptom, but some unthrifty animals were killed. Segregation of the affected animals and isolation of the sows until their piglets were six weeks old controlled the outbreak.

The skin lesions were infective by intraderm. inoculation into another pig, and produced typical umbilicated pustule formation but no definite vesicles. Otherwise only slight malaise was produced. Emulsions of the internal organs at the 10th day produced malaise and a temperature, but no pox lesions in a second pig, and a contact pig remained healthy. Rabbits, g. pigs and pigeons were not susceptible to the disease.

II. M. describes this disease as found in Iowa. It was readily transmitted to pigs, but not to rabbits. The histology of the skin lesions was found to be identical in field cases, accidentally infected pigs and one inoculated case. The typical change found was termed vacuolar degeneration, and the increase in the thickness of the epidermis was due to swelling of individual cells rather than to an increase of cells. No large vesicles or pustules developed but the general character of the lesions was pox-like.

In the discussion on this paper one speaker mentioned that in all outbreaks in which the incidence of the disease was high the pigs were lousy.

III. K. describes the cause, symptoms and lesions of this disease of pigs. It attacks pigs of all ages, up to two and a half months being the most susceptible age. Diagnosis is rather difficult because the pox lesion is less characteristic than in other variolas, and because occasionally it occurs along with swine erysipelas. The disease is most important in connexion with the serum-virus prophylaxis of swine fever when it may cause severe post-vaccinal losses if concurrent in the herd with the vaccination.—C. V. Watkins.

I. Naik, R. N. (1936). **Observations on Doyle's Disease [Newcastle Disease] of Fowls.**—*Indian J. vet. Sci.* **6.** 322-327. 2 tables. [9 refs.]

II. Sahai, L. (1937). **Doyle's Disease [Newcastle Disease] of Fowls: its Diagnosis and Control.**—*Agric. Live-Stk India.* **7.** 11-17.

I. N. carried out a series of experiments with trypan blue, three under field and one under artificial conditions. In the field experiments, 1-3 c.c. of a 1% solution of trypan blue in normal saline was inoculated (intraven.) into in-contact birds, in conjunction with the use of potassium permanganate in the drinking water and the destruction of sick birds. Over 80% escaped infection as a result, it is claimed, of this treatment. In the experiment carried out under artificial conditions, birds were injected with the solution and, subsequently, some were artificially infected at varying intervals, and some were exposed to natural infection. All died.

II. The disease is defined and the susceptible species enumerated. It usually breaks out after the rains in June or July, and lasts until December or January. The characteristic symptoms and *post-mortem* findings are described, and the average incubation period is given as three and a half days. No successful preventive inoculation, vaccine or curative treatment is known. The isolation of new purchases, destruction of infected birds and the rigorous disinfection and cleansing of buildings is advised.—R. Fisher.

Arroyo Martin, C. (1936). La laringo-traqueo-bronquitis infecciosa de las gallinas en España. [**Laryngotracheo-bronchitis of Fowls in Spain**].—*Trab. Inst. Biol. anim. Madr.* **4.** 7-37. 2 figs., 9 tables.

Thirty-seven fowls were studied; 24 were young and of these 19 died while only 3 old fowls died; 15 had the respiratory type, 14 the digestive and 8 the

digestive-respiratory type of the disease. The virus is not found exclusively in the respiratory organs, being also found in the abdominal cavity and in richest concentration in the duodenal mucosa. Emulsions of duodenal wall can produce typical symptoms in healthy animals.

The virus is also found in external parasites on affected fowls and is transmitted by them when they are transferred to healthy stock. Experimental infection can be produced through the digestive and respiratory tracts, through the skin and also subcutaneously.

The author considers that the name is not satisfactory, as other organs than the respiratory tract are affected.—A. H. Hunter.

Burnet, F. M., & Lush, Dora. (1936). **The Immunological Relationship between Kikuth's Canary Virus and Fowl-Pox.**—*Brit. J. exp. Path.* **17.** 302-307. 4 tables. [9 refs.]

B. and L. show that the viruses of fowl pox and Kikuth's canary disease (a highly fatal disease in canaries due to a filtrable virus which, on intramuscular inoculation into the canary, produces an inflammatory necrotic local lesion and a generalized infection through the blood) can be accurately titrated by the pock-counting method on the chorio-allantoic membrane of the developing egg. When the same technique is used, cross-neutralization tests show that the two viruses, though not identical, are serologically very closely related.

The experiments recorded demonstrate the value of this technique in investigating the serological relationship of two strains of virus which produce distinct lesions on two different host species, and the advantages of a direct comparison of the two viruses on a common susceptible organism, the developing egg.—R. F. G.

I. Brody, A. L. (1936). **The Transmission of Fowl-Pox.**—*Mem. Cornell agric. Exp. Sta.* No. 195. pp. 37. 3 text figs., 28 figs. on 3 plates, 4 tables. [Numerous refs.]

II. DeVolt, H. M., Moulthrop, I. M., & Davis, C. R. (1936). **The Vaccination of Baby Chicks against Fowl Pox.**—*Bull. Md agric. Exp. Sta.* No. 395. pp. 627-633. 2 figs., 2 tables. [5 refs.]

III. Lubbehusen, R. E., & Beach, J. R. (1937). **Fowl-Pox Vaccination of Day-Old and Older Chicks. Second Report.**—*J. Amer. vet. med. Ass.* **90.** 430-446. 5 tables. [3 refs.] [See also *V. B.* **7.** 332].

IV. Kaura, R. L., & Iyer, S. G. (1936). **Studies on the Diphtheritic Form of Fowl-Pox in India.**—*Indian J. vet. Sci.* **6.** 313-321. 3 figs. on 2 plates, 3 tables. [12 refs.]

I. The experiments carried out show that infection may spread by direct contact in the absence of intermediary hosts such as insects, and may also be spread by the mosquitoes *Aedes stimulans* and *A. aegypti*. In the experiment with *A. stimulans* one mosquito only was used; this one was allowed to feed on a lesion on an infected bird and 28 minutes later on a susceptible bird. A pox lesion developed in this bird at the feeding point.

In the experiments with *A. aegypti* numbers of the mosquitoes were used and, of these, some that transmitted the infection one hour after feeding on a lesion transmitted it again from 39 to 41 days later.

Experiments with the mite *Liponyssus sylviarum* showed that infection could be spread by using the ground-up bodies of mites that had fed on infected birds four days previously, but living mites that had fed on an infected bird did not transmit infection when allowed to feed on susceptible birds four and nine days later.

In an experiment using pins infection persisted on them for as long as 42 days.

II. Seventy-three 12-day-old chicks were inoculated with fowl pox virus by pricking the skin with a sharp knife point. Local reaction was apparent in the majority on the fourth day. Systemic reaction developed on the eighth day, as a result of which four chicks died and the remainder lost weight. On the 30th day the majority had recovered.

Seven months from the date of vaccination 57 of the vaccinated birds, 33 pullets and 24 cockerels, were tested for the presence of immunity when 15 of the pullets and two of the cockerels were found to be immune.

III. The experiments recorded here show that chicks vaccinated at any time from one day old to 6 weeks of age suffer a considerable check in growth and have a lowered resistance to coccidiosis. In one experiment observations were continued in the pullets over the first five months of egg production when the control pullets showed a mortality of double that of the vaccinated birds.

IV. This work shows that the virus causing fowl pox in India is identical with that causing the disease in Great Britain.—W. J. Ironside.

I. Perdrau, J. R., & Todd, C. (1936). **The Relation of Pathogenic Viruses to the Cells of Their Hosts.**—*Proc. roy. Soc.* Ser. B. **121.** 253-264. 5 tables. [8 refs.]

II. Hirano, N., & Sayama, K. (1936). **The Photodynamic Effect of Various Dyes on Vaccine Virus.**—*Kitasato Arch.* **13.** 324-332. 4 tables. [5 refs.] [In English].

I. In previous communications [*V. B.* **3.** 544, and **4.** 237.] P. and T. have shown that in the absence of living cells, certain viruses are rapidly inactivated when irradiated in the presence of methylene blue. In the present experiments, they have studied four viruses *viz*, fowl plague, vaccinia, herpes and " louping ill ". Animals were inoculated by various routes with cell-free virus suspensions and selected tissues, removed at regular intervals, were mixed with methylene blue and irradiated.

In each instance, there was a latent period varying from 30 minutes to 3 hours (fowl plague) up to 18 hours, (herpes) during which the virus was still sensitive to the procedure, but thenceforward a high degree of protection was noted. It is suggested that this phenomenon is linked with the entrance of the virus into the living cell.

Experiments *in vitro* showed that living, resting cells from normal animals were far less capable of affording protection to viruses than those from injected animals, but that actively growing tissues such as chick embryo cells could be readily infected with the virus in a very short time. The suggestion is made that infection of cells with a virus takes place most readily when the former are actively dividing.

II. A series of experiments was undertaken on the photodynamic inactivation of vaccine virus in the presence of various dyes in high dilution. It was found that dyes of the thiazine group, *viz* methylene blue, toluidine blue, thionine and methylene green were markedly lethal, whereas the action of gentian violet, Nile blue, night blue, methyl green, fuchsin, eosin and neutral red respectively, was minimal or negative. Inactivation of the virus did not take place in the absence of oxygen.

The potency of rays passed through red cellophane was similar to that of sunlight while ultra-violet rays were inactive.—R. E. Glover.

Blaker, G. H. (1936). **Intra-Uterine Vaccinia in Pregnant Animals.**—*Indian med. Gaz.* **71.** 446-449. 1 fig. [8 refs.] [Copied *verbatim* from *Bull. Hyg., Lond.* **12.** 188. Signed O. K. Wright].

In the course of routine vaccination for supplying lymph at the Burma Vaccine Depot, some full-grown animals were tried with a view to increasing the supply of lymph, and one of these, a female, was found at autopsy to be pregnant. While the foetus itself was free from blemish the inner surface of the amnion was studded with umbilicated vesicles. Following on this several more cattle as well as a number of rabbits were vaccinated cutaneously with ordinary lymph during pregnancy. The amniotic fluid as well as the amnion was in each case found to contain considerable amounts of bacteria-free vaccine virus, and this method is suggested for obtaining virus for initiating culture experiments. The amnion of the cattle was in each case found to be studded with vesicles while in the rabbits no amniotic vesicles were seen. In all cases the foetus was free from vesicles.

I. Gins, H. A. (1936). Ueber die Beziehungen der Schafpocken (Clavelée) zu der Vaccine und der Variola. [**Relation of Sheep Pox to Vaccinia and Variola**].—*3rd int. Congr. comp. Path. 1936.* **1.** Pt. 1. Vet. Sect. 121-139. [In German : French summary].

II. Mélanidi, C., & Tzortzaki, N. (1936). La variole caprine. [**Goat Pox**]. —*Ibid.* 182-193. [9 refs.] [In French].

III. Akazawa, S. (1936). **Animal Experiments with the Scab-Virus of Sheep Pox with Special Reference to its Vaccination.**—*J. Jap. Soc. vet. Sci.* **15.** 262-276 of pt. 1. 1 text fig., 5 figs. on 2 plates, 1 chart. [19 refs.] [In Japanese : English summary pp. 70-72 of pt. 2].

I. A review article. Both sheep pox and variola virus can be converted into vaccinia virus by passage through various animals, but the vaccinia virus of sheep pox cannot be reconverted to the natural virulent form. The value of anti-sheep pox vaccination depends upon a number of factors the significance of which is not understood, and at present it is doubtful whether any known vaccine is suitable for field control of the disease.

II. Cattle, horses, dogs, rabbits and poultry are all susceptible to the virus of goat pox, whilst man is insusceptible, but the disease only appears in epizootic form amongst goats. The incubation period in goats is 2-3 days, and there follows a stage of skin eruptions lasting 2-3 weeks. Virus is found in the pustular liquid and in the milk. It is claimed that a vaccine prepared against goat pox protects sheep against sheep pox.

III. Virus was obtained by carbolizing scabs from a case of suspected sheep pox, the extract being washed free of phenol and glycerinated. This virus, inoculated into the scarified cornea of sheep, pigs and calves, caused clouding. Vesicles by generalization of virus resulted from intradermal inoculation. Passage of virus through rabbits enhanced its virulence and its immunizing power.—E. J. P.

I. McCordock, H. A., & Smith, Margaret G. (1936). **The Visceral Lesions Produced in Mice by the Salivary Gland Virus of Mice.**—*J. exp. Med.* **63.** 303-310. 5 figs. on 3 plates. [3 refs.]

II. Markham, F. S., & Hudson, N. P. (1936). **Susceptibility of the Guinea Pig Fetus to the Submaxillary Gland Virus of Guinea Pigs.**—*Amer. J. Path.* **12.** 175-182. 3 figs. on 1 plate. [4 refs.]

III. Lucas, A. M. (1936). **Ultracentrifugation of Intranuclear Inclusions in the Submaxillary Glands of Guinea Pigs and Ground Moles.**—*Ibid.* 933-947. 9 figs. on 1 plate. [Numerous refs.]

I. In these experiments, the authors used two strains of mice, one of which was spontaneously infected with a mouse salivary gland virus, while the other was free from the disease when first dealt with. Intraperitoneal or intracerebral inoculations of the clean stock with a heavy glandular suspension from the infected animals resulted in a mortality of about 50% with the production of extensive lesions in various organs. Attempts at serial passage of the virus were unsuccessful.

II. Suspensions of salivary gland virus from infected g. pigs were inoculated intracerebrally or directly into the placenta of g. pig foetuses *in utero*. When removed by caesarian section several days later, profound generalized changes were found which were ascribed to the action of the virus. The severity of the lesions seemed to depend upon the dose of virus injected.

III. Centrifugation of submaxillary gland virus in the high speed apparatus of Beams and Pickels [(1935). *Rev. Sci. Instrum.* **6.** 299.] as modified by Bauer and Pickels [*V. B.* **7.** 449.] causes the intranuclear inclusion bodies to be displaced to the centrifugal pole of the nucleus.—R. E. Glover.

PARASITES IN RELATION TO DISEASE (ARTHROPODS).

Zunker. (1936). Schaf- und Ziegenräude. [**Sheep Scab and Goat Mange**].—*Berl. tierärztl. Wschr.* **52.** 579.

An abstract of a paper delivered to the Berlin Veterinary Society, on psoroptic scab in sheep and demodectic mange in goats. Observations on the duration of infectivity of pens vacated by scab-infected sheep, and on the life-cycle of the psoroptic scab-mite, are recorded. [These agree with the findings of other workers, and contain nothing new—see *V. B.* **7.** 3].

Experiments on resistance of mites off their hosts indicated that, under moist conditions, female mites retained their vitality for 9 days at room temperature, and eggs for 6 days. Eggs were viable for 10 days at 2°-4°C.

Demodectic infection was found to occur in 3·3% of adult goats examined. An eczematous skin condition of young goats was studied, but its relation to demodectic infection in the adult was not demonstrated.—J. MacLeod.

Mlinac, F., & Oswald, B. (1936). Početna istraživanja o otrovnosti vrsta krpelja u Jugoslaviji. I. Hyalomma aegyptium Linné (Neumann). [**Preliminary Studies on the Poisonous Properties of the Species of Tick Found in Yugoslavia**].—*Jugoslov. vet. Glasn.* **16.** 415-421. 2 figs. [18 refs.] [English summary].

In the autumn of 1935, M. and O. diagnosed tick paralysis in ruminants in southern Yugoslavia. On account of the heavy losses caused by this disease, they started a systematic investigation of all the species of tick found in the country. The following species were found :- *Hyalomma aegyptium*, *Ixodes ricinus*, *Dermacentor reticulatus*, *Rhipicephalus bursa*, *R. sanguineus*, *Haemaphysalis punctata*, and *Boophilus annulatus*.

The poisonous property of *H. aegyptium* was tested by means of the " crushed eggs method " as described by Regendanz and Reichenow. This method was improved by M. and O. so that precise work is possible. One part of eggs is crushed with four parts of saline, and the extract is filtered and heated at 59 C. for one hour. Thus, the extract becomes nearly sterile, but it remains fully toxic. Such an extract was inoculated (subcut.) into the dorsal part of the neck of an adult g. pig. With a dose of about 0·5 c.c. of extract, *i.e.* 0·1 g. of eggs, per kg. body weight, symptoms of tick paralysis were produced within one or two days, followed by death by the fifth or sixth day.

Post-mortem findings were either negative or revealed local serous infiltration of the subcutaneous tissue, sometimes with petechiae. The blood was dark and semi-liquid.

The thermolability of the hyalomma toxin at 85°C. for 15 minutes or at 100°C. for one minute was also proved.

TZORTZAKIS, N., & PAPADAKIS, G. (1936). La paralysie à tiques chez l'homme et chez les animaux domestiques. [**Tick Paralysis in Man and Animals**]. —*3rd int. Congr. comp. Path. 1936.* **2.** 449-452. [In French].

Tick paralysis is common in the Islands of Crete and Tinos during the rainy season. Sheep and goats are the only animals affected and *Ixodes ricinus* and *Haemaphysalis punctata* are the parasites chiefly responsible.

The ticks attach themselves in great numbers to the skin of the head and around the vulva and anus, and symptoms of tick paralysis often follow in the infested sheep. The affected animals have a sleepy appearance, rise with difficulty and there is a marked pyrexia throughout the course of the disease. The mortality is about 25%, death usually occurring within three days.

Attempts to reproduce the disease by injections of material from affected animals have failed, and the inoculation of extracts of ticks has only produced local reactions. T. and P., however, consider that it is probably caused by some poisonous substance elaborated by the parasites.—F. BLAKEMORE.

JACK, R. W. (1936-37). **Ticks Infesting Domestic Animals in Southern Rhodesia.** —*Rhod. agric. J.* **33.** 907-929 and **34.** 25-37. 25 figs., 1 table. [12 refs.] [Reprinted in *Bull. Min. Agric. S. Rhod.* No. 1011. pp. 35].

A popular article summarizing, for the benefit of agriculturists, the life-histories and habits of 11 species of Ixodid and of three Argasid ticks known to occur in Southern Rhodesia. A general account of control measures, and of the theory of dipping, is included.—J. MACLEOD.

ANON. (1937). **Report of Committee on Tick Eradication** [**U.S. Live Stock Sanit. Ass.**]—*J. Amer. vet. med. Ass.* **90.** 453-456. 1 table.

A résumé of the results of the campaign against the cattle piroplasmosis tick, *Boophilus annulatus* var. *australis*, during the period July, 1906 to December 1st, 1936, giving statistics of the size and number of counties released from quarantine in each of the southern states. Of the 985 counties, comprising 728,565 square miles, originally quarantined, 951 counties, and 95% of the total area, have been released.—J. MACLEOD.

KNIPLING, E. F., & WELLS, R. W. (1935). **Factors Stimulating Hatching of Eggs of *Gasterophilus intestinalis* de Geer and the Application of Warm Water as a Practical Method of Destroying these Eggs on the Host.**— *J. econ. Ent.* **28.** 1065-1072. 1 fig., 2 tables. [5 refs.]

Experiments showed that the eggs of *Gastrophilus intestinalis*, the horse bot fly, hatch in response to the stimulus of a sudden rise in temperature. The lower the initial temperature the greater the percentage of eggs which hatched when exposed for one minute to a temperature of 40°C. Friction or moisture were shown to be unnecessary as stimuli. Under optimum conditions over 95% of the eggs hatched when immersed in warm water.

After oviposition by this fly ceases in late autumn, the unhatched eggs on the hairs of the horse retain their viability for long periods, and provide an important source of reinfestation. K. and W. found that sponging infested horses with

warm water induced the eggs to hatch, and recommend this treatment as a preliminary to winter dosing for bots in the stomach. The temperature of the water should be from 104°F. to 118°F. during application, and the treatment should be carried out on days when the air temperature is 60°F. or lower. —J. MacLeod.

Carpentier, G., & Pelletier, L. (1936). A propos d'un cas d'hypodermose équine. La larve de l'hypoderme du boeuf arrive-t-elle à maturité chez le cheval ? [**A Hypoderma Larva in a Horse**].—*Rec. Méd. vét.* **112.** 705-711. 2 figs. [6 refs.]

C. and P. describe the finding of a second-stage larva of *Hypoderma bovis* in a subcutaneous tumour on the withers of a mare in northern France. They discuss the existing records of cattle warbles in horses and point out that, so far, no authenticated instance is known of a mature third-stage larva occurring in horses : it remains an open question, therefore, whether *H. bovis* or *H. lineatum* can become mature in this host [see also Johansson. *V. B.* **7.** 76].—J. MacLeod.

Schwardt, H. H. (1936). **Horseflies of Arkansas.**—*Bull. Ark. agric. Exp. Sta.* No. 332. pp. 66. Numerous figs. and tables. [Numerous refs.]

The dominant species of horsefly in Arkansas, U.S.A., is *Tabanus costalis* Wied., with *T. lineola* Fabr., *T. atratus* Fabr., and *T. sulcifrons* Macq. also of economic importance. Forty-three other species are known to occur in the State.

Biological notes, based on laboratory rearings and field studies, are given of 22 species of Tabanidae, belonging to the genera *Tabanus*, *Chrysops*, and *Goniops*. The life-histories and seasonal distribution of eight species, including those of economic importance, are given in some detail.

Clearing of vegetation and debris from the banks and margins of ponds is suggested as a control measure.—J. MacLeod.

I. MacLeod, J. (1936). **A New Blowfly attacking Sheep in Western Scotland.** —*Nature, Lond.* **138.** 467-468. [3 refs.]

II. Haddow, A. J., & Thomson, R. C. M. (1937). **Sheep Myiasis in South-West Scotland, with Special Reference to the Species involved.**—*Parasitology.* **29.** 96-116. 3 figs. [Numerous refs.]

I. *Phormia terrae-novae* R.-D. was reared in pure culture from seven cases of blowfly myiasis of sheep in western Argyll and Mull in 1936.

II. The authors bred out, from larvae infesting sheep in western Scotland, the following species of flies :– *Lucilia sericata* Mg., *L. caesar* L., *L. illustris* Mg., *Protophormia terrae-novae* R.-D. [this is the same species referred to in I, the synonymy of which is in confusion], *Calliphora erythrocephala* Mg., *C. vomitoria* L. and *Muscina papulorum* Fallen.

The technique employed for rearing the flies without danger of contamination is described, and observations are recorded on the commoner causes of strike under Scottish farming conditions, and on the various preventive measures employed in the area.—J. MacLeod.

PARASITES IN RELATION TO DISEASE (HELMINTHS).

I. Leiper, R. T. (1936). **Crustacea as Helminth Intermediaries.**—*Proc. R. Soc. Med.* **29.** 1073-1074.

II. Peters, B. G. (1936). **Some Recent Developments in Helminthology.**—*Ibid.* 1074-1084. [Numerous refs.]

III. Guenther, F. (1936). Wurmtoxine und ihre Wirkung im tierischen Organismus. [**The Action of Worm Toxins on the Animal Body**].—*Berl. tierärztl. Wschr.* **52.** 616-618.

IV. Tao, C. S. (1936). **Transmission of Helminth Ova by Flies.**—*J. Shanghai Sci. Inst.* Sect. IV. **2.** 109-116. 2 tables. [6 refs.]

I. In his explanatory remarks, accompanying a microscopic demonstration and exhibition of lantern slides, L. stressed the need for regional surveys of the species of Crustacea and especially those of the genus *Cyclops* in view of the great importance of these essential intermediaries in the spread of disease. Mention is made of the numerous species of the parasitic worms of vertebrates which pass some of the early stages of their development in *Cyclops*.

II. Under the headings "Life-History Anomalies", "Resistance to Digestion", "Metabolism", "Immunity", and "Immunological Reactions", this paper gives a good review of the recent work which has advanced the knowledge of the biology of the cestodes of man and of animals.

III. G. gives a very general account of present knowledge and opinions on toxin production by parasitic worms with particular reference to their influence on anaemia.

IV. T. collected about 140,000 flies of the genera *Compsomyia*, *Lucilia*, and *Musca* from 64 different places in the city of Shanghai.

Examination of material from 16 traps showed the presence of the eggs of *Ascaris*, *Trichocephalus* and *Ancylostoma* in eight. The infection was found usually to be carried in the intestine of the flies, but a few were also carried on the legs. —E. L. Taylor.

Schoop, G., & Dedié, K. (1936). Der Darmsaugwurm Tocotrema lingua bei deutschen Silberfüchsen. [*T.l.* **in a Silver Fox**].—*Dtsch. tierärztl. Wschr.* **44.** 579-581. 4 figs., 1 table. [5 refs.]

An autopsy on a silver fox revealed the presence of large numbers of a small trematode, only 2 mm. long, in the mucous membrane of the whole length of the small intestine. Examination showed the fluke to be *Tocotrema lingua* (Creplin 1825), Looss 1899, which occurs in the dog, cat, seal, and in various water fowl, as well as in foxes.

A search for a similar infestation was carried out on farms in the same neighbourhood, bordering on the North Sea and five more infested farms were found. Fish act as carriers of the metacercariae of this fluke and fish was used as the food for the foxes in each of these instances of infestation.

Tetrachlorethylene in doses of 0·5 c.c. per kg. body weight gave very promising results in treatment.—E. L. Taylor.

Wolffhügel, K. (1936). Fimbriariinae (Cestodes). [**Fimbriariinae**].- *Z. InfektKr. Haustiere.* **49.** 257-291. 4 figs., 4 tables. [Numerous refs.]

W. gives a comprehensive survey of the literature on Fimbriariinae, with a list of all the species which have been described since 1900. The new genera *Profimbriara* and *Fimbriariella* are proposed and *F. plana* is considered to be a synonym of *F. fasciolaris*. The close affinity with the Hymenolepididae is recognized.—E. L. Taylor.

Alicata, J. E. (1936). **The Amphipod,** *Orchestia platensis*, **an Intermediate Host for** *Hymenolepis exigua*, **a Tapeworm of Chickens in Hawaii.**- *J. Parasit.* **22.** 515-516. 1 fig.

A. has found the small amphipod *O. platensis* (a minute crustacean) to be

acting as intermediate host in the development of *H. exigua*, the life-history of which was previously unknown. Of 50 specimens which were caught on a poultry farm, 32 were found to be naturally infested with the cysticercoid. Both the cysticercoid and the egg of *H. exigua* are described.—E. L. Taylor.

I. de Graaf, C. (1936). Een en ander over de cysticercosis bij het schaap. [**Cysticercosis in Sheep (Review)**].—*Tijdschr. Diergeneesk.* **63.** 547-556. 1 table. [19 refs.] [English and German summaries].

II. de Waele, A., & Dedeken, L. (1936). Het evaginatieproces bij Cysticercus bovis en de migratie van den parasiet bij den mensch. [**Evagination of Bovine Cysticerci and their Migration in Man**].—*Vlaam. Diergeneesk. Tijdschr.* **5.** 115-120. [4 refs.] [French summary].

I. *Cysticercus inermis* of cattle and *C. cellulosae* of pigs (the latter is practically unknown in Holland) are the two cysticerci referred to in the Dutch meat inspection instructions. *C. ovis* is often found in the hearts of sheep. It is not dangerous to man, as the adult *Taenia ovis* occurs only in the dog. Consequently sheep suffering from cysticercosis are declared fit for consumption without any restriction.

II. W. and D. studied a case of cysticercosis in a 20-month-old ox in which 12 nodules as large as filberts were noticed on the epicardium and all over the muscles and organs, while the masseters were literally riddled.

In Belgium, in contrast with other countries, the incision of the masseter is not legally prescribed. The evagination process and the mechanism of the immigration of *C. bovis* were studied, also the evagination process in the first and second phases in *C. pisiformis*.—M. J. J. Houthuis (Rotterdam).

Trawinski, A. (1936). Ueber Anwendung der Präzipitationsreaktion zum Nachweis der Schweinezystizerkose. [**Precipitation Test for Swine Cysticercosis**].—*Zlb. Bakt. I. (Orig.).* **136.** 116-120. 2 tables. [2 refs.]

T. carried out a series of precipitin tests on the blood serum and on extracts from the flesh of 26 pigs infected with *Cysticercus cellulosae* and on 50 normal carcasses, using an antigen prepared from the scolices of the cysts. Both blood serum and flesh extract from 21 of the 26 infected carcasses gave positive reactions, and material from all of the 50 normal carcasses gave negative reactions.—E. L. T.

Parnell, I. W. (1936). **Studies on the Bionomics and Control of the Bursate Nematodes of Horses and Sheep. III. Further Observations on the Toxicity of Urine and Some Related Substances for Sclerostome Larvae in Feces.**—*Canad. J. Res.* Sect. D. **14.** 172-180. 4 figs., 4 tables. [15 refs.] [See also *V. B.* **5.** 30, and **7.** 284.]

Continuing his tests on substances lethal to sclerostome larvae in horse manure, P. finds that the effect of cow urine is more variable than that of horse urine, and that all urines gradually lose their killing power. Ammonia by itself is very lethal, 0·75 c.c. of a 27% solution sterilizing a 40 g. sample of faeces. Acetone is much less effective.—T. W. M. Cameron.

I. Cram, Eloise B. (1936). **Species of *Capillaria* Parasitic in the Upper Digestive Tract of Birds.**—*Tech. Bull. U.S. Dep. Agric.* No. 516. pp. 28. 12 figs., 2 tables. [Numerous refs.]

II. Wehr, E. E. (1936). **Earthworms as Transmitters of Capillaria annulata, the " Crop-Worm " of Chickens.**—*N. Amer. Vet.* **17.** No. 8. 18-20. 1 fig. [4 refs.]

I. A comprehensive account is given in this paper of present knowledge on

11 avian species of *Capillaria* occurring in parts of the digestive tract anterior to the intestines.

Three species are regarded as responsible for severe pathological effects, *C. annulata* in the mucosa or submucosa of the mouth, oesophagus and crop of a large number of gallinaceous and anseriform birds (*C. lophortygis* and *C. perforans* are regarded as synonymous with this specific name), *C. contorta* which occurs in the oesophagus, and especially in the crop, of several gallinaceous birds, and *C. dispar* which occurs in the tongue and oesophagus of birds of prey.

The life-cycle of *C. contorta* was successfully worked through and transmission from one species of host to several others was successfully brought about.

H. W. repeated attempts which had previously been made by Cram to infect chickens, quail and guinea-fowl with *C. annulata*, and obtained similarly negative results; an attempt to transmit infection by contact, in which heavily infected birds were confined in contact with uninfected birds for six and a half months, also gave negative results. Search was then made for an intermediate host and the following invertebrates were tried :– *Melanopus sp.*, *Aphodius sp.*, *Onthophagus sp.*, *Armadillidium vulgae*, *Porcellio scaber*, and *Helodrilus foetidis*. All gave negative results except the last mentioned, an earthworm which was found to be capable of transmitting the infection.

Larvae similar to those which have been described for *Trichuris trichura* were recovered from the infected earthworms; an illustration is given. *Helodrilus caliginosus* was afterwards found also to transmit infection, and it is evident that *C. annulata* uses earthworms as intermediate host.

This finding is unexpected and clearly indicates the necessity for revising current ideas on the life-histories of nematodes of the sub-order Trichurata. —E. L. Taylor.

Cuillé, J., & Darraspen, E. (1936). Contribution à l'étude clinique de la strongylose cardio-pulmonaire du chien. Manifestations nerveuses. **[Cardiac and Pulmonary Strongylosis of the Dog. Nervous Symptoms]**.—*Rev. vét., Toulouse.* **88.** 249-255.

Infestation by *Angiostrongylus vasorum* is common in south-east France. It is diagnosed by the co-existence of nervous symptoms and the dilation of the right heart, and by the discovery of the larvae in the sputum and faeces (except from November to January, when they are absent).

In the early stages, the nervous symptoms are provoked by violent exercise, and they comprise generalized trembling, vertigo and epileptiform fits. While at rest a state of extreme excitement may occur, the dog beginning to bark and run about. In advanced cases there is dullness and torpidity. Choreiform symptoms are exceptional.

Cerebral lesions being extremely rare, the nervous symptoms are probably sequelae of the cardiac dysfunction.—E. W. Ascoli.

Ascoli, E. W. (1936). **Some Experiences of Parasitic Tracheo-Bronchitis in the Dog, due to *Oslerus osleri*.**—*Vet. Rec.* **16.** 14-17. 1 photograph.

A series of cases of *O. osleri* infestation was studied, and attempts at treatment made.

In well-established cases, the symptoms comprised attacks of violent coughing (especially during excitement), severe dyspnoea, " wheezing " during rest and sleep, and a whistling sound on auscultation of the thorax, referable to the bifurcation of the trachea. Severe respiratory symptoms may arise with extraordinary suddenness.

The period between leaving the infected premises and the appearance of the symptoms may be as long as eight months.

Faecal examination for larvae was positive in two cases out of four.

The treatment recommended comprised two intratracheal injections of a 5% aqueous solution of phenol (1 c.c. for a small dog) with an interval of one week, a third injection being given later if necessary. The technique is described. Of six fairly early cases so treated, four made rapid recoveries and two died from pneumonia (one being a puppy).

Griffiths, H. J. (1936).—**On the Fourth Stage Larva of** *Chabertia ovina*.—*Canad. J. Res.* Sect. D. **14.** 168-171. 5 figs. [4 refs.]

The fourth or pre-adult stage larva of *Ch.o.* is provided with a small provisional mouth capsule, with a small dorsal cone at the base. The larva is 1·79 mm. long and occurs in the large intestine.—T. W. M. Cameron.

Ortlepp, R. J. (1937). **The Biology of Onchocerciasis in Man and Animals.**—*J. S. Afr. vet. med. Ass.* **8.** 1-6.

A review article on the subject of onchocerciasis in which the most important facts in connexion with the disease are given. The work of Blacklock in Sierra Leone on the life-history of the larvae of *O. volvulus* of man in the gnat *Simulium damnosum* is described and the life-history of *O. reticulata* of the horse in the midge *Culicoides nubeculosus*. In South Africa the nodules of *O. gibsoni* are present in the brisket but the infection may spread to the head, neck and shoulders, thorax, flanks and hind limbs. Some hundreds of nodules may be found in one animal. In Australia it is unusual to find more than 50 nodules in any one animal.—E. M. R.

I. Papadaniel. (1936). La dermatose ou gale microfilarienne du cheval en Grèce. [**Microfilariasis of Horses in Greece**].—*Ann. Méd. vét.* **81.** 420-427. 4 figs. [6 refs.]

II. Granouillit, F., & Do-Van-Vien. (1936). Contribution à l'étude de Dirofilaria immitis et de sa microfilaire. La microfilariose du chien en Cochinchine. [*D.i.* **and its Microfilariae in Dogs in Cochin-China**].—*Rev. vét., Toulouse.* **88.** 617-630. 2 tables.

I. A description is given of the lesions, including their distribution and development. The continued appearance of new lesions prolongs the disease for months and perhaps years. In cold weather the lesions improve. There were no signs of general disturbance.

The parasite is found particularly in the papules in the early stages of their development. There is no periodicity. The technique adopted for the preparation of fresh specimens is described. For morphological examination the specimens are stained with a solution of azure blue. A description is given of the parasite as seen in the fresh specimen and when stained. The pathological anatomy of the lesions is discussed.

II. The disease is wide-spread in native and imported dogs in Cochin-China, and advantage was taken of the capture of numerous stray dogs to carry out a systematic blood examination ; a study of the survival of the parasite *in vitro* was also made. The technique for taking and preserving the blood specimens is described, cardiac puncture being recommended. Citrate kills the parasite.

Consideration is given to the incidence of infection. Accuracy can only be assured by blood examinations and *post-mortem* examination. An average of at least 25 % of all dogs in Cochin-China are considered to be infected. There is no periodicity as to time or days and the number of parasites observed appears to

have little relationship to the clinical condition. The right side of the heart and to a less extent the pulmonary artery appear to be the commonest sites of the adult worm. When not found *post mortem* in these sites *D. repens* or *Acanthocheilonema* appear to be concerned. Some of the clinical signs, which are not significant are noted. Native dogs are perhaps more resistant than imported dogs.

Drug treatment has so far proved ineffectual. As a prophylactic measure against this disease and rabies the authors recommend more intensive capture and slaughter of the numerous stray dogs.—F. H. Manley.

Ackert, J. E. (1936). *Physaloptera felidis* **n. sp., a Nematode of the Cat.**—*Trans. Amer. micr. Soc.* **55.** 250-254. 6 figs. [2 refs.]

The *post-mortem* examination of a domestic cat at Manhattan, Kansas, revealed the presence of 23 nematodes of the genus *Physaloptera* in the stomach and duodenum, apparently belonging to a new species which A. proposes to name *P. felidis*. In this species the vulva of the female is anterior to the base of the oesophagus, the length and width of the spicules are characteristic as are also the number and arrangement of the bursal papillae.—E. L. Taylor.

Swales, W. E. (1936). *Tetrameres crami* **Swales, 1933, A Nematode Parasite of Ducks in Canada. Morphological and Biological Studies.**—*Canad. J. Res.* Sect. D. **14.** 151-164. 10 text figs., 5 figs. on 1 plate. [16 refs.]

T.c. has been found to be the most important nematode of domestic ducks in Quebec and has been found in 12 wild species. The parasite is redescribed in detail and its life-cycle fully elucidated; this involves an amphipod vector, *Hyalella knickerbockeri*, which is the main intermediate host for wild ducks, or *Gammarus fasciatus*, which is mainly responsible for the infestation of domestic ducks. The biology of the vectors and the disease caused in ducks by the parasite are also discussed.—T. W. M. Cameron.

IMMUNITY.

Moen, J. K. (1936). **A Skin Test for Detecting Group C Hemolytic Streptococcal Infection Causing Epizootic Lymphadenitis in Guinea Pigs. Applications in Selecting Breeding Stock.**—*J. exp. Med.* **64.** 553-558. [6 refs.]

M. has used a crude bacterial extract of Group C haemolytic streptococci from cases of epizootic lymphadenitis in g. pigs for detecting non-clinical cases of the disease. The reaction is somewhat similar to the tuberculin reaction. Of 330 apparently normal animals 20 reacted, but none of these showed macroscopic lesions of the disease on autopsy.—D. L. Hughes.

Gerlach, F. (1936). Ueber Erfolge, Unzulänglichkeiten und Misserfolge der wichtigsten Schutz- und Heilimpfungen gegen tierische Infektionskrankheiten. [**Value of Immunization Methods used in Veterinary Medicine**].—*Wien. tierärztl. Mschr.* **23.** 662-670.

After a short discussion of the general properties of vaccines, toxins and sera, G. deals with specific protection against various diseases of animals – swine erysipelas, anthrax, blackleg, tetanus, swine fever, foot and mouth disease, rinderpest, tuberculosis (BCG), various diseases of young animals, bovine contagious abortion, fowl cholera, rabies, fowl pox and contagious bovine pleuro-pneumonia. He concludes that for many of these there is as yet no satisfactory method.

—A. W. Stableforth.

Siebert, W. W., & Seffert, H. (1936). Blutgruppen und Blutstrahlung. [**Blood Groups and Mitogenetic Radiation from Blood**].—*Biochem. Z.* **287.** 109-112. 1 fig., 1 table. [Copied *verbatim* from *Physiol. Abstr.* **21.** 823. Signed L. P. Kendall].

Normal blood taken on blotting paper and extracted with distilled water after drying, emits mitogenetic radiation. It was found that in mixtures of such extracts of bloods of blood group A with those of blood group B the radiation was suppressed, but that it persisted when other combinations of the 4 blood groups were used. Physical and biological methods of detection of the radiation gave the same result. Serum alone emits no radiation. It therefore appears that the factor responsible for the radiation is present in the corpuscles and that the reaction causing agglutination also inactivates the radiating unit, since only in the A+B mixture are the corpuscles of both bloods agglutinated and the radiation suppressed.

DISEASES, GENERAL.

Roberts, R. S. (1937). **Field and Laboratory Diagnosis of Disease in Sheep Flocks.**—*Vet. Rec.* **49.** 258-262.

R. discusses methods of diagnosis with particular reference to lamb dysentery, pulpy kidney disease of sucking lambs, gastric and intestinal parasites, " husk ", " pining ", braxy-like diseases of adult sheep caused by *Clostridium welchii*, infectious pneumonia and lactation tetany. He emphasizes the necessity of considering the history of the outbreak and management of the flock in conjunction with routine methods. The differential diagnosis and the special points to be looked for in diagnosing these diseases are given.—R. Fisher.

Breed, F. (1937). **Major Acute Infections in Swine.**—*Vet. Med.* **32.** 117-121. 2 figs., 1 table, 1 photograph.

B. briefly reviews three major diseases of swine, namely, swine fever, swine erysipelas and necrotic enteritis. For each he states the cause, symptoms and details required for field diagnosis. As a guide for the latter he appends a table which gives a summary of the usual lesions found in these diseases.—C. V. W.

I. Munro, S. S. (1936). **The Relation of Production to Mortality in the Domestic Fowl.**—*J. agric. Sci.* **26.** 101-113. 7 tables. [5 refs.]

II. Guenther, D. F. (1937). Aus den Arbeiten der Reichszentrale für die Erforschung und Bekämpfung der Geflügelkrankheiten beim Reichsgesundheitsamt. [**Work of the Reich Centre for Research and Control of Poultry Diseases at the Reichsgesundheitsamt**].—*Tierärztl. Rdsch.* **43.** 114-115.

III. Anon. (1937). **Report of Committee on Transmissible Diseases of Poultry** [**U.S. Live Stock Sanit. Ass.**]—*J. Amer. vet. med. Ass.* **90.** 424-430.

I. Although mortality in laying flocks has increased to alarming proportions, careful analysis of the data furnished by the Canadian Egg Laying Contests fails to indicate that heavy egg production shortens the life of the pullet. On the contrary, lighter laying birds appear more likely to die. Also, although the mortality rate appeared to parallel the egg-production rate, there was in reality no connexion. Further, modern husbandry practices could not be incriminated.

II. Since 1929 the collaboration of some 30 institutes has provided important information about various poultry diseases. Pullorum disease and coccidiosis have shown a remarkable decrease, roup and fowl pox are less prevalent, while fowl

paralysis shows a remarkable increase. Experiments failed to demonstrate any specific virus in fowl paralysis. It seems probable that inherited factors play an important part, and further investigation into the role of food in this disease has been ordered.

III. Poultry diseases and their control are reviewed. The activities of the administration under the Pure Food and Drugs Act is described. Biological products of merit are described, two of the most important and successful being laryngotracheitis and fowl pox vaccines. Some doubt exists as to when such treatments should be given, and some states control their use to prevent the introduction of disease by carriers into healthy flocks. Vaccines and sera have never suppressed a disease except temporarily. They must be combined with sanitary measures, together with steps towards the detection and elimination of infected birds.—R. Fisher.

—. (1937). [Papers by Davenport, C., Rabagliati, D. S., & Edwards, J. T., with General Discussion]. **Purpuric Conditions in Animals.**—*Proc. R. Soc. Med.* **30.** 723-729. [7 refs.]

D. pointed out that comparison of the purpuras of animals and man is extremely difficult, if not impossible. He then described purpuras in the horse, ox, dog and cat. In horses purpura not uncommonly follows infectious disease. Formalin given intravenously has been followed by good results.

Bracken poisoning and sweet clover disease are described as examples of purpura in cattle. References were made to records of purpura in dogs and cats.

R. referred to an earlier account [(1906). *J. comp. Path.* **19.** 113.] of purpura which he observed in 63 bulls which were being used as rinderpest antiserum producers in Egypt: it occurred after the injection of "reinforcing" doses of virulent blood into the immune bulls.

E. described the mode of producing rinderpest serum in India and described swellings following injections of the antigen.—J. E.

I. Marshall, C. J. (1937). **Periodic Ophthalmia.**—*Vet. Bull. U.S. Army.* **31.** 7-13.

II. Anon. (1937). **Statistics (Periodic Ophthalmia).**—*Ibid.* 14-18. 2 tables.

I. Periodic ophthalmia appears more often in certain localities than in others, but is seldom reported west of the Rocky Mountains. The disease does not appear to be contagious but M. gives an account of [very briefly observed] experiments carried out in U.S.A. In carrying out this work rabbits and horses were injected with material from diseased and normal eyes. Rabbits were susceptible to injections from both sources and proved unsuitable for the work, but practically every horse injected with material from diseased eyes developed a more or less pronounced inflammation which could not be differentiated from an attack of periodic ophthalmia. None of the animals suffered from a recurrent attack during the observations made over a period of one month.

II. A statistical study is made of the records relating to periodic ophthalmia collected from the U.S. army during the period 1923-1936. The aggregate number of cases reported was 2,100, the average animal strength being 36,594 horses and mules. The disease was three times more prevalent in horses than in mules and a study of 949 records relating to horses treated showed that both sexes were equally susceptible. The distribution of the disease was four times heavier in the Philippines than in the United States.—F. Blakemore.

Hastings, C. C. (1937). **Rhinitis of Pigs. (Bull Nose).**—*Vet. Med.* **32.** 142-143.

H. considers that this condition which is prevalent in the central western

states of America is different to that described by German workers as rhinitis and caused by *Pseudomonas pyocyanea* [this is not the accepted cause among German veterinarians – see *V. B.* **5.** 233. – Ed.] and, from the large number of infected pigs which develop scirrhous cord after castration, he thinks that " bull nose " is closely related to scirrhous cord and probably caused by a spirillum.

The American form of rhinitis is a chronic one, abscess formation often leading to bone necrosis and to a fistulous opening through the nasal bones between an eye and the snout. The turbinate bones are often involved and pseudomembrane formation may be due to secondary infection by *Fusiformis necrophorus*. H. advises correct hygiene and the slaughter of advanced cases.—C. V. Watkins.

Verge, J., Tachon, L., & Drieux, H. (1937). Contribution à l'étude des lésions nodulaires du muscle chez les bovidés : le granulome de Roeckl. [**Muscular Nodules (Roeckl's Granuloma) in Cattle**].—*Rec. Méd. vét.* **113.** 129-143. [Numerous refs.]

This condition has been recorded in the literature under a large variety of names, blastomycosis, nodular muscle necrosis, nodular muscle tuberculosis, embolic muscle tuberculosis, pseudotuberculosis and nodular pyobacillosis. The lesions are found in bovines of any age and of either sex. They are not usually noticed during life, being first discovered when the carcass is cut up into joints. They are most often found in the muscles of the tail, also in the musculature of the neck, back and loins and in the subcutaneous tissues. They are firm, greyish nodules, varying from the size of a pin's head to that of a hazel nut. Abscesses never develop.

The authors describe five cases together with the results of histological and bacteriological examinations. No bacteria were detected in stained smears of the lesions, and acid-fast bacteria were absent both in smears and in histological sections suitably stained. G. pigs and rabbits inoculated with material from muscle nodules remained healthy throughout the observation period of over six months, and no lesions were found *post mortem*. Histologically, the nodules consisted of a centre of necrosis surrounded by a zone of granulation tissue rich in plasma cells and eosinophile leucocytes. No epithelioid or giant cells were found.

Some nodules contained sarcosporidia and others showed round or oval bodies, staining with basic dyes, and 1-5μ in diameter. The latter occurred both free and intracellularly within vacuoles. It would appear that, of the theories discussed – neoplastic, parasitic, mycotic and bacterial – the authors are inclined to consider sarcosporidia and yeasts as possible causal agents, but no clear evidence is given in support of either.—E. G. White.

I. Manz, W. (1936). Ursachen, Verbreitung und wirtschaftliche Bedeutung der Unfruchtbarkeit des Rindes in den Kreisen Wetzlar und Giessen. [**Sterility in Cattle near Wetzlar and Giessen**].—*Tierärztl. Rdsch.* **42.** 849-854. 1 fig. [11 refs.]

II. Stolz, H. (1936). Beitrag zur Kenntnis der Deckinfektionen des Rindes und deren Bekämpfung. [**Transmissible Genital Infections in Cattle**].—*Inaug. Diss., Giessen.* pp. 64. 6 tables. [Numerous refs.]

I. In the vicinity of Wetzlar and Giessen the most frequent cause of sterility is trichomonas ; other causes are bovine genital vesicular exanthema (" Bläschenausschlag ") genital tuberculosis and, rarely, *Brucella abortus*.

Information is given concerning the measures taken to deal with the infection, being those generally in use.

II. S. covers much the same ground, referring to trichomonad infection,

vesicular exanthema and to a non-specific vaginitis. In the control of genital infections the system advocated by Professor Küst is most successful. Artificial insemination is indicated for the prevention of reinfection.

—G. Hartmann (Vienna).

I. Schlotthauer, C. F. (1937). **Diseases of the Prostate Gland in the Dog.** —*J. Amer. vet. med. Ass.* **90.** 176-187. 7 figs. [Numerous refs.]

II. Zuckerman, S., & Groome, J. R. (1937). **The Aetiology of Benign Enlargement of the Prostate in the Dog.**—*J. Path. Bact.* **44.** 113-124. 3 text figs., 15 figs. on 7 plates, 2 tables. [9 refs.]

I. In dogs, there exists a constant relationship between the weight of the prostate and body weight up to five years of age. The mean value found was 0·4 g. prostate per kg. body weight. After the age of five years, this ratio varies very widely. Approximately 60% of the prostates examined were considered to be abnormal histologically. The commonest condition was benign hypertrophy, often accompanied by cystic degeneration. Suppurative prostatitis was fairly common. Malignant tumours of the gland were not observed.

The greater part of the paper deals with the physiology of the prostate and with suggestions as to treatment of prostatic enlargement.

II. The prostate glands of nine dogs were examined histologically. One was normal, seven showed simple glandular hyperplasia and one a condition which was considered identical with that produced in the prostate of dogs treated with oestrone. It is suggested that enlargement of the prostate may be the result of excessive production of this hormone.—E. G. White.

Boyd, W. L., & Bishop, Lucille M. (1937). **Pyelonephritis of Cattle and Horses.** —*J. Amer. vet. med. Ass.* **90.** 154-162. 2 figs. [9 refs.]

Pyelonephritis was not reported in the United States until 1918. It is considered to be generally urogenous and seldom haematogenous in origin. This is supported by the fact that the bladder and ureters are usually involved, whereas structural changes usually associated with embolic nephritis of haematogenous origin are absent. Corynebacteria are a constant feature in both horses and cattle, and other organisms such as streptococci are considered to be secondary invaders. The symptoms and *post-mortem* appearances are characteristic. Diagnosis is made on a chemical, bacteriological and physical examination of the urine, bladder, ureters and kidneys. Treatment is unsuccessful.—R. Fisher.

Widik. (1936). Kurzer Bericht über Untersuchungen an Schlachtkälbern mit Flecknieren. [**Spotted Kidneys in Calves**].—*Wien. tierärztl. Mschr.* **23.** 749.

W. examined material from 90 calves showing " white spotted kidneys ". It was not possible to isolate *Brucella abortus* culturally or by animal inoculation from any of the animals. No agglutinins to this organism were found in the blood taken at slaughter.—E. G. White.

I. Hughes, E. H., & Hinman, R. (1936). **Trembling in Pigs.**—*J. Amer. vet. med. Ass.* **89.** 96-97. [3 refs.]

II. Knilans, A. J. (1936). **Trembling in Pigs.**—*Ibid.* 590-591.

I. Five piglets from a Poland China litter and 9 from a Duroc Jersey litter showed various degrees of trembling when standing up, but not when recumbent. The condition cleared up gradually, but the cause was not found. Three reports of a similar malady are discussed.

II. Similar cases are described. About 40% of the piglets in 5 litters born of interrelated sows were affected, whilst pigs of seven other litters on the same farm were normal. The piglets showed more or less violent trembling, but fed and developed as well as normal ones. They all became normal soon after being turned out into a clover pasture.—J. E.

VON MOĆSY, J. (1936). Ueber das Schicksal des aus den Muskelfasern ausgetretenen Myoglobins. [**Fate of Myohaemoglobin Evacuated from Muscle Fibres**].—*Arch. wiss. prakt. Tierheilk.* **70.** 212-226. 5 figs., 1 table. [9 refs.]

In previous papers [*V. B.* **6.** 360 and 445.] it has been shown that the colour of urine in equine haemoglobinaemia paralytica is due to myoglobin and not to haemoglobin. In the present paper an excellent description is given of the physico-chemical properties of myoglobin and of its derivatives, oxymyoglobin, metamyoglobin and myochromogen. The absorption spectra and curves are discussed. This is followed by a discussion of the changes occurring in the blood and urine, of the myoglobin derived from the muscle fibres in cases of myoglobinaemia and myoglobinuria, and of the conditions necessary for the change to the reduced or oxidized state of the myoglobin. A paper to be read by all interested in the disease.—JAMES STEWART.

JONKER, B. (1936). Kopziekte. Grastetanie. Eclampsie van het rund. Overeenkomst met paeresis pueperalis en acetonaemie. [**Milk Fever and Allied Conditions**].—*Tijdschr. Diergeneesk.* **63.** 177-184 and 264-276. [Numerous refs.] [English, French and German summaries].

J. discusses grass tetany, milk fever and acetonaemia, drawing attention to points of resemblance and suggesting that on clinical and pathological grounds the term eclampsia is preferable to grass tetany. He suggests that intoxication of intestinal origin may be the primary cause in all three disorders and that the syndrome varies with the nature of the toxin and the extent to which the liver is affected.—H. H. GREEN.

DANIEL, H. A. (1935). **The Total Calcium, Phosphorus and Nitrogen Content of Native and Cultivated Plants in the High Plains of Oklahoma and a Study of the Mineral Deficiencies that may develop in Livestock when Emergency Feeds are fed.**—*Panhandle Bull.* No. 56. pp. 18. 5 tables. [Num. refs.]

A study was made of the total Ca, P, and N content of mature weeds, grasses, legumes, and mature and immature sorghum, the heads being removed from the mature sorghum plants. The samples were collected for analysis during September and October, 1934, from fields and virgin soils in the Panhandle counties of Oklahoma.

The results showed that Russian thistles and wild sunflowers were higher in Ca and P than alfalfa. The native weeds were higher in Ca than grama grass, but prickly pears and sage-brush were lower in P than this grass. Of the weeds analysed, Russian thistles were highest in N and beargrass lowest. Immature sorghum that did not produce heads was higher in P and N than mature plants with the heads removed, but the latter plants were higher in Ca. The heads and grain from the mature plants were very low in Ca and high in P and N. Badly burned plants were also high in Ca and P.

The total Ca and P content of these plants was compared with data secured from areas where mineral deficiencies in forage caused certain diseases and abnormal development of livestock. It is recommended that in order to reduce the possibilities of mineral deficiencies a mixture of forages be fed. When available,

legumes should be fed with forage sorghum, but when not available, wild sunflower and Russian thistle may be used as an emergency feed.—R. Allcroft.

Rimington, C. (1937). **The Occurrence of Carotinoids in Animal Sera : the Danger of mistaking Carotinaemia for Bilirubinaemia.**—*J. S. Afr. vet. med. Ass.* **8.** 7-9. [7 refs.]

Carotinaemia in the pig, g. pig, and rabbit and most probably also in the dog, never occurs. Horses and particularly cattle may show such a degree of it that their serum is a deep yellow colour. Before any conclusions are drawn as to the presence of icterus from examination of the serum it is essential that tests should be made for the presence of bilirubin.—E. M. Robinson.

Newsom, I. E., & Cross, F. (1934). **Feedlot Diseases of Lambs.**—*Bull. Colo. agric. Exp. Sta.* No. 409. pp. 39. 23 figs., 1 chart. [Numerous refs.]

In Colorado the growth of the sheep industry has led to an increase in the incidence of disease and a brief description is given of the conditions which cause the heaviest losses.

Haemorrhagic septicaemia often occurs in lambs within a month of their arrival at the fattening stations and its development is influenced by the character of the weather and the conditions of train transport. The causal organism is of low virulence and the disease only spreads when the resistance of the animals is lowered.

Paratyphoid dysentery is believed to be fairly common in the state and again, unfavourable conditions during transport are held to be an important predisposing cause. Two outbreaks of dysentery in lambs are described which were shown to be due to *Salmonella typhi-murium*, the symptoms in these cases being not unlike those of coccidiosis which is also frequently observed in the district.

Considerable losses are attributed to overeating, the condition resembling enterotoxaemia as described in Europe. N. and C. have not been able to satisfy themselves however, that the disease is primarily due to bacterial infection or to the adsorption of *Clostridium welchii* toxin.—F. Blakemore.

Salsbery, C. E. (1937). **Hairless Pigs : Goiter.**—*Vet. Med.* **32.** 139.

S. remarks upon the prevalence of this disease in the northern states of America and in Canada among spring piglets in certain years. Changes of food and management did not influence the incidence of the disease. An enlargement of the thyroid gland was found to be present in almost all cases. A slight thickening and wrinkling of the skin of the head and neck was also noted. The daily addition of one or two grains of potassium iodide to the food during gestation was prophylactic.—C. V. Watkins.

Michalka, J. (1936). Gesundheitsschäden beim Schwein, bedingt durch Unsere Heutigen Fütterungsmethoden. [**Feeding Methods which are Harmful to Swine**].—*Oest. Tierarzt.* **9.** 123-129.

A general discussion, without fresh protocols, dealing with the need for correct preponderance of basic over acid radicles in a ration, for avoidance of excessive protein feeding, and for due consideration of minerals and vitamins. —H. H. Green.

Goettsch, Marianne, Pappenheimer, Alwin M., & Hart, Anna. (1936). **Brain Weight and Moisture Content in Normal Chicks and those with Nutritional Encephalomalacia.**—*Amer. J. Physiol.* **115.** 610-617. 3 figs., 1 table. [11 refs.]

Young chicks on a synthetic diet which contained all the factors known to be necessary for normal rat growth developed nutritional encephalomalacia, *i.e.* a severe brain disorder preventable by the addition of the non-saponifiable fraction of soya bean oil.

From observations made on a large number of normal and diseased chicks it was found that nutritional encephalomalacia occurs during the period of active brain growth which corresponds to an age of 9 weeks on an optimum diet. The weights of the whole brain, cerebrum and cerebellum are dependent upon the body weight and are not influenced by age, sex or rate of growth. The percentage of water in the different parts of the brain of normal chicks, 8 to 60 days of age, was found to be constant and independent of the age of the chick or size of the brain, while acute encephalomalacic lesions in either cerebellum or cerebrum are characterized by increased weight and moisture content.—R. Allcroft.

Arroyo, C., & Campos, R. (1936). Carencia e infeccion : una enfermedad en los patos con este doble aspecto. [**Avitaminosis and Infection in Ducks**]. —*Trab. Inst. Biol. anim. Madr.* **24.** 63-69. 3 tables.

Ducklings aged from one to three weeks were affected with impaired vision, loss of equilibrium and irregular gait. Coughing was present with a clear mucous discharge, also diarrhoea. *Post-mortem* examinations showed pulmonary congestion, slight enteritis and a pale yellow colour of the liver in many cases. As treatment fresh beer yeast, " vogan ", and fresh milk were used in 14 cases.

Salmonella enteritidis and *Bact. coli* were isolated from dead ducklings, and from fresh and incubated eggs, but A. and C. consider that these only contributed in a secondary manner to aggravate the condition.—A. H. Hunter.

PUBLIC HEALTH.

Sarnowiec, W. (1936). Contribution à la recherche du bacille tuberculeux dans le lait, le beurre et le fromage blanc. [**Presence of Tubercle Bacilli in Milk, Butter and Cheese**].—*C. R. Soc. Biol. Paris.* **123.** 370-372. [6 refs.]

S. has examined by cultural methods and g. pig inoculation samples of butter and cheese taken before and after exposure to sale for various periods, specimens being taken from the surface and deeper portions. He concludes that contamination with tubercle bacilli may occur during exposure for sale.—A. W. S.

I. Lerche, M., Nieder, H. J., & Zinn, E. (1936). Die Untersuchung roher und erhitzter Milch auf " mikroskopisch nachweisbaren Eiter". [**Detection of Pus in Raw and Heated Milk**].—*Z. Fleisch- u. Milchhyg.* **47.** 25-28 and 50-54. 6 tables.

II. Seelemann, M., Wolf, C. H., & von Gartzen, M. (1936). Untersuchungen zur Festlegung des Begriffes "mikroskopisch nachweisbarer Eiter" im Sinne der Ersten verordnung zur Ausführung des Milchgesetzes. [**Significance of " Microscopically Demonstrable Pus " in Relation to Milk Law, Germany**].—*Arch. wiss. prakt. Tierheilk.* **71.** 41-64. 8 figs., 3 tables. [8 refs.]

I. L. N. and Z. conclude that for this examination whole milk is preferable to sediment but suggest that, if excessive cells and no mastitis streptococci are found in smears from whole milk, smears should be made with sediment after heating and centrifuging.

For whole milk, 0·02 c.c. is spread on an area of 4 sq. cm. For sediment, the

sample should be heated to 85°C., spun at 3,000 r.p.m. for 10 minutes and a 1·5 mm. loopful of the deposit spread on the slide. In both cases methyl alcohol is used for fixation and methylene blue, toluidin blue or Giemsa recommended for staining. " Recognizable pus " is considered to be present (1) when clumps of leucocytes and mastitis streptococci are present, and (2) when the pus cells are distributed, but in excessive numbers, *i.e.* 3 or more per field in preparations from whole milk or 100 or more in the case of preparations from sediment.

Various methods have been investigated and it is pointed out that, though 50 fields must be examined with whole milk, this takes less time than counting a few fields of a sediment preparation.

II. S., W. and G. have made a detailed study of various methods of demonstrating the presence of pus in milk for the purpose of official control. They advocate a uniform method as follows :– 10 c.c. of milk should be centrifuged at 3,000 r.p.m. for 10 minutes and a smear of sediment made with a 3 mm. loop over an oval area of 3 sq. cm. After fixation the smear should be stained with toluidin blue. Ten fields should be examined. All milk samples which have not been previously heated sufficiently to have lost their raw milk reaction (guaiacum test) should be heated to 85°C. in order to obtain with them results comparable with those of heated samples sent for examination, as it has been found that more leucocytes are found in heated than in raw milk sediment. Milk should be withheld from sale if it shows an average of 40 or more leucocytes per field and any *Streptococcus agalactiae*, or if typical pus flakes are found in at least one half of the fields examined.—A. W. Stableforth.

Mazzeo, M. (1936). Sull'anello colorato di Schern e Gorli. II. Differenziazione rapida del latte vaccino da quello ovino e caprino. [**Differentiation of Cows' Milk from Sheep and Goat Milk by the Schern-Gorli Ring Test**].—*Clin. vet., Milano.* **59.** 717-720. [6 refs.]

M. examined numerous milk samples by means of a modified form of the Schern-Gorli test. Milk from sheep and goats invariably failed to react to the test so that it can be easily distinguished from cows' milk which always gives a positive reaction when fresh. In mixed samples, the reaction becomes clearer in proportion to the amount of cows' milk present. If this is less than 10% no reaction is obtained.—J. A. Nicholson.

THERAPEUTICS.

Bennett, S. C. J. (1936). **Toleration of Naganol (Bayer 205) by Horses.**—*J. comp. Path.* **49.** 304-309. 1 fig.

Five horses from which *Tryp. brucei* and *Tryp. congolense* had been recovered, living in a *Glossina morsitans* area in which no horse had previously survived for more than a few weeks, were each given 2 g. doses of naganol. The best interval between doses was found to be 10-12 days and all tolerated the injections to a greater extent than is usually believed. One horse has received treatment for nearly five years. No dose lower than 2 g. will prevent a relapse, and no increase in dosage is tolerated.—R. Fisher.

Cangi, C. W. (1937). **Treatment for Whipworms in the Dog by Intracecal Injection.**—*Cornell Vet.* **27.** 21-24.

Laparotomy is performed as for spaying, and santonin, suspended in glycerin and water, is injected into the caecum by hypodermic syringe. C. summarizes 21

cases treated, showing, as judged by clinical examination, 6 definite failures and 15 possible successes.—E. E. JELBART.

RIETZ, J. H. (1936). **Mass Feeding of Sheep with Copper Sulphate and Salt to Control Gastro-Intestinal Parasites.**—*Bull. W. Va agric. Exp. Sta.* No. 271. pp. 11. 4 tables. [9 refs.]

R. tested a 1 : 30 mixture of copper sulphate in salt fed *ad lib.* as a lick to 20 ewes. The ewes consumed it at the rate of 0·5 lb. of lick each per month. Control animals included 7 ewes which received a 1·5% copper sulphate solution every 3 weeks, and 4 untreated ewes. The lick mixture was poisonous but did not control nematode parasites (there were 600% more nematode eggs in the faeces at the end of the year). It was less effective in a 1 : 50 concentration and was still poisonous.

The regular dosing of the copper sulphate solution was effective for nematode parasites and also eliminated cestodes. There was practically no difference in the efficacy of this solution and of a mixed solution of 1·5% copper sulphate with 1·5% nicotine sulphate during a further 8 months test.—C. V. WATKINS.

WRIGHT, J. G. (1937). **Insulin in the Treatment of Equine Myoglobinuria.**—*Vet. Rec.* **49.** 187-189.

In equine myoglobinuria, or so-called " azoturia ", there is usually present a hyperglycaemia combined with an increased phosphate and creatinine content of the blood. In the light of this finding it has been suggested that injections of insulin might be a useful method of treating cases of this disease. The author describes two cases which received this treatment. One very severe case received daily 100 units of insulin intramuscularly for ten days and by the last day of the treatment was able to walk about freely. The other, a less severe case, received four doses of 150 units and was able at the end of another five days to return to work. As the death-rate in this disease is given as from 75% to 90% W. suggests that the treatment is worthy of an extended trial. [The above findings would have been more valuable if biochemical data had been given].—JAMES STEWART.

HOPKIRK, C. S. M. (1937). **Cobalt Feeding Experiment at Arohena.**—*N.Z. J. Agric.* **54.** 344-349. 4 figs., 2 tables.

Four groups of sheep and lambs were chosen on a farm in the " bush sick " area of the North Island.

The sheep of one group each received 3·5 c.c. twice a week of a solution of Co sulphate containing 1 mg. per c.c. A second group received 7 c.c. each of the solution per week. The third group received 30 c.c. each once a month and the fourth group acted as controls, receiving no Co. Lambs received half quantities.

The controls did badly, several animals dying from " bush sickness ". Those dosed monthly did badly but only one died. The other two groups did well. It is pointed out that, although giving Co in doses of 1 mg. per day keeps sheep healthy, the drenching method is not practicable.

SHAW, J. N., & MUTH, O. H. (1937). **The Use of Acidophilus Milk in the Treatment of Dysentery of Young Animals.**—*J. Amer. vet. med. Ass.* **90.** 171-175. [5 refs.]

Following the success of attempts to eliminate certain intestinal pathogens in affected human beings and monkeys by using *Streptobacillus acidophilus* in milk culture, S. and M. treated enteritis and dysentery in lambs, calves, foals and pups with *Lactobacillus acidophilus* cultured in sterilized milk, and report that it is

useful both as a prophylactic and as a therapeutic agent. They emphasize that the principle of the treatment depends not on the production of lactic acid but on the number of viable organs in the culture, and that it should be prepared under laboratory conditions. The method of preparation is given.—E. E. JELBART.

HORVATH, E. (1936). Untersuchungen über die Automatie des Pferdeuterus und deren Beeinflussung durch Lentin und Hypophysenextrakte. [**The Response of the Isolated Equine Uterus to Lentin and Pituitary Extracts**].—*Inaug. Diss., Vienna. 1935.* [Abst. from abst. in *Wien. tierärztl. Mschr.* **23.** 653].

H. observed that the normal non-gravid equine uterus, isolated and suspended in Tyrode solution, shows automatic and rhythmic contractions at intervals of three to five minutes. Pituitary extracts (" pituisan " and " orasthin ") intensified the contractions and " lentin " [an acetylcholine preparation] did likewise. The gravid uterus was less sensitive to the action of these substances, but responded to large doses.—J. E.

MILLER, A. P. (1936). **Chlorine Disinfectants—Their Role in Combating Communicable Diseases.**—*Soap.* **12.** 103-109. [Copied *verbatim* from *Publ. Hlth Engng Abstr.* **16.** 14. Signed C. G. GILLESPIE].

In the practice of curative medicine, disinfection ordinarily consists of burning the discharges and soiled articles, but mercuric chloride, carbolic acid, cresols, and others have a place, and chlorine should be included, as well as in terminal disinfection in combination with washing with hot water, soap and washing soda. Use of chlorine in contributing to remarkable decline in typhoid fever, is traced. Chlorination of newly laid water mains is becoming common. Chlorine and chlorine-containing compounds are indispensable in the water supply problem accompanying many disasters. The Public Health Service in its supervision of drinking water on vessels, finds that storage tanks frequently need disinfection after a vessel has been laid up. Calcium hypochlorite is used. Chlorination in the field of sewage treatment is increasing. It is also being used to kill anthrax in certain trade wastes but as a practice, more emphasis should be enforced in the tannery. Notwithstanding division of opinion on the role of swimming pools in spreading disease, chlorination is used extensively.

Pasteurization of milk is not a substitute for clean milk and chlorine could be used more extensively in the milk industry, in the cleansing of premises, milkers' hands, etc. There is a growing use of chlorine treatment to condition moderately contaminated clams and to some extent, a similar treatment of contaminated oysters. Another field of use mentioned is in the disinfection of utensils and glassware.

POISONS AND POISONING.

PLAIZKOVSKI, U., & SVENSSON, S. (1936). Experimentell talliumförgiftning hos hund ock höns. [**Experimental Thallium Poisoning in Dogs and Fowls**]. —*Skand. VetTidskr.* **26.** 68-86. 8 figs. [8 refs.] [English summary].

Six dogs and seven hens were experimentally fed with varying amounts of " zelio-corn " and " zelio-paste ", two rat-destroying substances containing thallium, the dosage being from 0·1 – 0·5 g. thallium sulphate to the dogs and from 0·01 – 0·1 g. to the hens. The lethal dose for a medium-sized dog was estimated to be from 0·1 – 0·2 g. and, for a hen, from 0·05 – 0·06 g. The symptoms shown were, acute or chronic, according to the dose given, and, in the

case of dogs, the most striking features were respiratory disturbances and rapid emaciation within 10 days. No well-marked *post-mortem* lesions were seen, but slight alterations were observed in the kidneys, intestines and lymph nodes.

A method of chemical analysis is described by which small traces such as 5 mg. thallium sulphate per 100 g. matter can be detected. The parts of the body best suited for such an analytical test are stated.—Gustav Naerland (Oslo).

PHYSIOLOGY.

Isaacs, R. (1937). **Formation and Destruction of Red Blood Cells.**—*Physiol. Rev.* **17.** 291-303. 1 table. [Numerous refs.]

A good summary of recent advances in our knowledge of red blood cell development, much of which has been derived from the work on pernicious and other anaemias.—A. Robertson.

Sjollema, B. (1936). Over de beteekenis van het reguleerings-mechanisme. [**The Regulating Mechanism of Metabolism**].—*Tijdschr. Diergeneesk.* **63.** 423-432 and 490-498. [5 refs.] [German summary].

A semipopular discussion of physiological mechanisms controlling stability of the organism as a whole, dealing with intercausal relationships between temperature, blood pressure, corpuscular elements and chemical components of blood and tissues, vegetative nervous system, endocrine organs and reticulo-endothelial system. In disturbance of equilibrium sympatheticotonic and parasympatheticotonic phases succeed one another. Non-specific therapy alters existing states so as to call forth these biphasic responses. The concentration of electrolytes in various tissues plays an important part in cellular response to stimuli. Intravenous injections of Ca in milk fever and Mg in grass tetany are regarded as non-specific therapy.—H. H. Green.

Wilcke, H. L. (1937). **The Relative Value of Farm Grains in Poultry Nutrition.** —*J. Amer. vet. med. Ass.* **90.** 188-193. 2 figs., 2 tables. [1 ref.]

A feeding experiment on chicks showed that rations consisting of large amounts of ground whole oats as the sole source of cereal grain were much more satisfactory for growth and feathering than rations consisting of wheat or corn with the same supplements. The differences in the protein content of the rations were not responsible for the differences in the growth and it appears that there is some constituent in oats and to a lesser extent in wheat, but lacking in corn, which is necessary for good growth and feathering in chicks.—R. Allcroft.

Brion, A. (1937). Chimie de la contraction musculaire. [**Chemistry of Muscular Contraction**].—*Rec. Méd. vét.* **113.** 257-272. [13 refs.]

A fairly detailed description of the present state of our knowledge about the chemistry of muscular contraction.—A. Robertson.

Koch, F. C. (1937). **The Male Sex Hormones.**—*Physiol. Rev.* **17.** 153-238. 2 tables. [Numerous refs.]

An excellent and detailed review which should be consulted in the original. —A. Robertson.

Chapman, A. B., & Casida, L. E. (1937). **Analysis of Variation in the Sexual Cycle and Some of its Component Phases, with Special Reference to Cattle.** —*J. agric. Res.* **54.** 417-435. 2 figs., 13 tables. [Numerous refs.]

The sexual cycles of various domestic animals were closely studied and the records so obtained, along with those of numerous other observers, were analysed in an attempt to determine the significance of the variations noted.

Some 30% of clinically normal cattle showed an oestrus cycle of 34 or more days, but extreme variation in the length of the cycle was usually an indication of ovarian abnormality and a warning of impending breeding difficulty. There was a slight increase in mean cycle length with increasing age in cattle, but no seasonal effects were evident. Cattle and swine showed an increase in the duration of oestrus with increasing age. Analysis of the published records on the length of the component phases showed a marked individuality in most of the phases in the different species studied.—A. Robertson.

OFFICIAL AND OTHER REPORTS.

Union of S. Africa. (1935). **The Health and Nutrition of the Union's Live Stock. Annual Report of the Division of Veterinary Services [1935].** [du Toit, P. J.]—*Fmg S. Afr.* **10.** 542-547. 1 fig., 3 tables.

The first portion of the report is devoted to the field work carried out during the year. No fresh outbreaks of foot and mouth disease occurred during the year and it was possible to relax some of the regulations, but the control measures on the Southern Rhodesian border were maintained. A very severe outbreak of African swine fever occurred in the Western Province and about 1,700 pigs died. Very active measures were taken to combat the disease by the slaughtering-out method, and at the end of the year the disease had been suppressed. There was a slight setback in the East Coast fever campaign in the Transvaal where several fresh outbreaks occurred. The dourine campaign was temporarily suspended owing to opposition on the part of horse-owners, and a number of positively reacting animals were bought for investigations at Onderstepoort. An increase in the number of outbreaks of rabies was recorded.

The second portion of the report is devoted to the research and routine work carried out at Onderstepoort and its substations. Increased outputs were recorded for most of the vaccines issued and there was a big demand for the newly introduced neurotropic virus vaccine for horse-sickness. A great deal of research work on various problems was carried out. Attempts were made to infect laboratory animals with the virus of bluetongue and the rickettsia of heartwater. Good progress was made with the typing of strains of horse-sickness and passing them through mice for incorporation in the vaccine. The biochemical work included an intensive study of the copper content of the organs of healthy and diseased animals. In the wool research department comparisons were made between artificial substitutes for wool and the natural product.—E. M. Robinson.

India, Assam. (1936). **Report of the Civil Veterinary Department for the Year, 1935-36.** [Ghose, S. C.] pp. 35 + 3. Numerous tables. Shillong: Assam Govt. Press. [8vo] [10 annas] [1s.]

(1) Staff.—The province was divided into four veterinary circles, Gauhati Circle No. 1, Gauhati Circle No. 2, Silchar, and Dibrugarh, each in charge of a veterinary inspector. In addition there were 60 veterinary assistant surgeons.

(2) Budget.—The total expenditure of the department of Rs. 1,83,097 (£13,732) of which Rs. 32,700 were devoted to hospitals and dispensaries. A special grant of Rs. 7,500 was made for research by the Imperial Council of Agricultural Research.

(3) Animal Diseases.—There were 15,000 deaths from Rinderpest, 1,600 from Haemorrhagic Septicaemia, 800 from Foot and Mouth Disease, 1,950 from Anthrax and 112 from Blackleg. Johne's Disease became an increased menace to the stock of the government farms and dairies, and a committee of enquiry was appointed by the Government of India.

(4) Preventive Inoculations.—23,500 cattle were given serum alone against rinderpest and goat virus was given to 70,000 cattle. The use of goat virus has been very successful and was generally applied to the control of outbreaks already in existence. The cattle of Assam are said to be four times more susceptible to rinderpest than those from neighbouring provinces so that the discovery of the comparatively non-dangerous goat virus is of very great advantage. 17,000 cattle were vaccinated against H.S. and 2,200 against anthrax.

(5) Hospitals and Dispensaries.—There were 3 veterinary hospitals and 21 dispensaries at which a total of 5,630 animals were treated during the year and 4,000 were castrated. 138,000 animals were treated on tour.

(6) Special Investigations.—A list of ten diseases, on which observations were made, is given.

(7) Education.—Six students from Assam were under instruction at the Bengal Veterinary College during the year.—J. E.

India, Bengal. (1936). **Annual Report of the Civil Veterinary Department, for the Year 1934-35.** [Kerr, P. J.] pp. 68. 16 tables, 1 chart, 7 appendixes. [8vo] [4 annas] [6d.]

(1) Staff.—The Presidency is divided into two main areas, West Range and East Range, each under an assistant director. There are eight veterinary inspectors and 130 veterinary assistant surgeons.

(2) Animal Diseases.—Rinderpest showed an increased incidence over that of the previous year, causing 14,000 deaths in 732 outbreaks. Haemorrhagic Septicaemia also showed an increase, 4,000 deaths being reported. Foot and Mouth Disease decreased, there being 377 deaths. Anthrax and Blackleg were prevalent. It is stated that chronic haematuria in cattle is enzootic in the hill districts.

(3) Preventive Inoculations.—The total figures are given in a table. 32,500 cattle were given rinderpest serum, 136,700, goat-tissue vaccine and 480, serum and virus. In 1933 a goat-tissue vaccine depot was founded and it has since been established as a permanent institution. 23,000 cattle were immunized against H.S. and a few thousand against anthrax and blackleg.

(4) Special Investigations.—Chronic bovine haematuria was the chief disease investigated. Two theories are advanced – (1) that it is due to a fluke trematode parasite *Eurytrema sp.*, and (2) that it is a protozoan infection. Bovine lymphangitis and filariasis were also investigated.

(5) Hospitals and Dispensaries.—98,400 animals were treated at the 55 dispensaries, 470 castrations were performed, 150,000 animals were treated on tour and 4,000 castrated.

(6) Education. Report of the Bengal Veterinary College. [MacGregor, A. D.] —170 students were under instruction during the year and 47 passed their third years' examination.

Attached to the college is the Raymond Research Laboratory, in which general instruction is carried out in diagnostic work and in which vaccines and serum are prepared. There is also under the control of the Principal, the Department of Epizootic Diseases of Animals in Calcutta, the staff of which consisted of seven inspectors to deal with contagious diseases of animals in the municipality.

Two serious outbreaks of glanders were observed, which were successfully stamped out. Outbreaks of equine influenza, rinderpest, blackleg, H.S. and F. & M. disease were also successfully controlled.—J. E.

India, Bihar & Orissa. (1936). **Annual Report of the Civil Veterinary Department, for the Year 1935-36.** [Riley, P. B.] pp. 4 + 28 + xxxiii + 3. 14 tables, 1 map. Bihar, Patna: Superintendent, Govt. Printing. [8vo] [Re. 1.4].

(1) Staff.—The Province was divided into three main districts, North Bihar Range, Central Range and Orissa Range, each under a veterinary superintendent. In addition there were 13 veterinary inspectors and 144 veterinary assistant surgeons.

(2) Budget.—The total expenditure was Rs. 7,31,062 (£54,830) of which Rs. 3,14,810 were spent on hospitals and dispensaries and 8,163 on veterinary research.

(3) Animal Diseases.—A map shows the incidence of the most important diseases. 1,246 outbreaks of Rinderpest with 6,400 deaths occurred; there were 605 outbreaks of Haemorrhagic Septicaemia with 2,600 deaths; 129 cattle died from Foot and Mouth Disease, 235 from Anthrax in 45 outbreaks, and 51 from Blackleg. No case of Glanders occurred, two horses died from Surra and one horse each from Anthrax and Rabies.

(4) Preventive Inoculations.—76,600 cattle were given rinderpest serum alone and 445,000, goat-tissue vaccine. 30,600 were immunized against H.S., 5,400 against anthrax [serum] and 2,700 against blackleg.

(5) Hospitals and Dispensaries.—A total of 99,000 animals were treated at the 33 dispensaries and 21,740 castrations were performed.

(6) Special Investigations.—Brief reference is made to research on rinderpest, Johne's disease, bovine brucellosis, fascioliasis, hump-sore in cattle and kumri.

(7) Education. Report of the Bihar and Orissa Veterinary College. [Davis, R. T.]—71 students enrolled for instruction during the year and nine qualified at the end of the third years' course. Research on kumri was carried out at the research laboratory of the college. Reference is also made to other research work and diseases investigated.

(8) Animal Census.—According to the 1930 census the total number of animals was 29,300,000.—J. E.

India, Central Provinces and Berar. (1937). **Annual Report of the Civil Veterinary Department for the Year ending 31st March, 1936.** [Garewal, J. S.] pp. 26. 1 appendix. Nagpur: Govt. Printer. [8vo] [Re. 1.8].

(1) Staff.—The Province is divided into three main districts each in the charge of an Assistant Director at Berar, Jubbulpore and Chhattisgarh respectively. There were 11 veterinary inspectors and 146 veterinary assistant surgeons.

(2) Budget.—The total cost of the department was Rs. 4,05,508 (£30,413), Rs. 1,00000 being devoted to hospitals and dispensaries and Rs. 22,500 to veterinary research.

(3) Animal Diseases.—There were 1,903 outbreaks of Rinderpest, 1,108 outbreaks of Haemorrhagic Septicaemia, 247 of Anthrax and 261 of Blackleg. Foot and Mouth Disease was prevalent and 59 cases of Trypanosomiasis were observed.

(4) Preventive Inoculations.—130,000 cattle were given serum alone, about 300, serum and virus, and 112,000, goat virus, against rinderpest. 250,000 cattle

were immunized against H.S., 6,000 against anthrax and 56,000 against blackleg. Trypan blue was issued for the treatment of piroplasmosis.

(5) Hospitals and Dispensaries.—223,600 animals were treated in 104 dispensaries and 770,400 were treated on tour, including 172,000 castrations.—J. E.

India, Madras. (1936). **Annual Administration Report of the Civil Veterinary Department for the Year 1935-1936.** [Saunders, P. T.] pp. 52. 5 appendixes. Madras: Govt. Press. [8vo] [8 annas].

(1) Staff.—The Presidency is divided into 12 veterinary circles each in charge of a district veterinary officer and there were in addition 282 veterinary assistant surgeons.

(2) Budget.—The total expenditure was Rs. 9,792,81 (£73,445) of which Rs. 2,83887 were spent on hospitals and 78,700 on a serum institute.

(3) Animal Diseases.—There were 398 outbreaks of Rinderpest with 2,750 deaths, 940 outbreaks of Haemorrhagic Septicaemia with about 5,660 deaths, 912 outbreaks of Foot and Mouth Disease with 976 deaths, 306 outbreaks of Anthrax with 2,380 deaths and 958 outbreaks of Blackleg with 5,860 deaths.

A serious outbreak of Bovine Trypanosomiasis near Madras killed off 191 cattle. Surra was observed in horses. A few cases of Bovine Tuberculosis and Johne's Disease were reported. 2,370 cases of nasal Schistosomiasis were observed. There were no cases of Glanders.

(4) Preventive Inoculations.—307 cattle were given rinderpest serum, 61,000 goat blood virus, and 111,600 serum-virus. 72,600 cattle were immunized against H.S. by serum alone. 7,800 cattle and 2,300 sheep and goats were immunized against anthrax. A total of 118,300 cattle were immunized against blackleg.

(5) Hospitals and Dispensaries.—A total of 25,000 animals were treated in the 115 dispensaries, 24,000 castrations were performed, whilst 120,000 animals were treated on tour and 48,500 were castrated.

(6) Special Investigations.—Experiments on rinderpest serum dosage showed that 6 c.c. of serum per 100 lb. body weight for cattle and 8 c.c. for buffaloes were sufficient in the serum plus virus method. The use of goat virus was extended as compared with the previous year; 1% of the animals vaccinated died as a result.

It was found that nasal schistosomiasis was very common and that a course of injections of tartar emetic effected a cure. "Antimosan" was also efficacious but expensive. "Trypaflavine" was of no use. Investigations showed that ox warbles were not present in Madras. Cutaneous myiasis in various species of animals was found to be caused chiefly by *Chrysomyia bezziana*. Rhinosporidiosis was observed in a bovine for the first time. Parasitic nodules in the liver and lungs of ponies were found to be associated with nematode larvae. Contagious pleuro-pneumonia in goats was investigated but the cause was not determined.

(7) Education. Report of the Madras Veterinary College. [Hurley, T. J.]—A Government Order of 1935 restricted the number of candidates from Madras Presidency to 30 and from other states to 10. 96 students were under instruction of whom 17 were from Burma. Five students completed the three years' course. Results of the diagnostic work of the laboratory are given. Rabies was diagnosed in 3 cattle, 35 dogs, 1 goat, 2 sheep and 1 deer.

(8) Serum Institute.—Details are given of the anti-rinderpest serum, haemorrhagic septicaemia serum and bull and goat rinderpest virus used during the year. Results of laboratory work are also given. Investigations showed that blood groups exist in buffaloes. Several small research projects were carried out

on H.S. with the object of improving immunization methods. Trials were carried out with rinderpest goat spleen vaccine and it was found that it caused no reaction after cold storage beyond 14 days. Goat-blood virus diluted 10 times in normal saline and kept in "an even temperature" for two days was found to have become avirulent.—J. E.

India, Punjab. (1936). **Annual Report of the Civil Veterinary Department, for the Year 1935-36.** [Quirke, T. F.] pp. ii + 47 + xxii. 11 figs. on 5 plates, numerous tables. Lahore: Superintendent, Govt. Printing. [8vo] [Re. 0.4] [5d.]

(1) Staff.—Excluding the work of the Punjab Veterinary College, which is dealt with below, the work of the department is divided into three circles with headquarters at Ferozepore, Ambala and Rawalpindi, respectively, each in charge of a superintendent. Each circle is then divided into three to five areas each in charge of a deputy superintendent, the latter having charge of the veterinary hospitals, itinerating veterinary assistants and animal husbandry work in his area. The total staff is 382 veterinary officers.

(2) Budget.—The total budget of the department was Rs. 18,93,252 (£142,000) including Rs. 2,52,595 for breeding operations, Rs. 1,25,671 for fairs and shows and Rs. 2,30,204 for the Hissar cattle farm.

(3) Animal Diseases.—Rinderpest, Haemorrhagic Septicaemia, Foot and Mouth Disease and Blackleg were very prevalent, but only three cases of Anthrax were reported.

(4) Preventive Inoculations.—90,000 cattle were immunized against rinderpest, mostly with goat tissue vaccine. 56,500 cattle were given antiserum and 395,500 were vaccinated against H.S. 20,350 cattle were vaccinated against blackleg.

(5) Veterinary Hospitals and Dispensaries.—330,193 animals were treated in the 300 hospitals and dispensaries and 734,770 were treated on tour, including 246,140 castrations.

(6) Education. Report of the Punjab Veterinary College, Lahore. [Taylor, W.]—There were 85 students during the year and 21 finished the four years' course. The Pathological Section produced a large amount of rinderpest vaccine and also antirabic vaccine. An investigation into septicaemia of calves was completed [*V. B.* **6.** 533]. The treatment of surra with Bayer 205 and tartar emetic was also studied. Brucellosis was investigated at the Government Farm, Hissar and work was done on equine encephalomyelitis and on immunization of dogs against rabies. A list of parasites identified by the Parasitological Section is given.

(7) Animal Census.—The total number of animals is given as 23,696,000. —J. E.

India, United Provinces. (1936). **Annual Report of the Civil Veterinary Department, for the Year 1935-36.** [Egan, T. J.] pp. vii + 25. Numerous tables, 1 map. Allahabad: Superintendent, Printing & Stationery. [8vo] [Re. 1.12].

(1) Staff.—The Provinces are divided into three main districts with headquarters at Agra, Lucknow and Allahabad respectively, each in charge of a superintendent, and there were 204 veterinary assistant surgeons.

(2) Budget.—The total cost of the department was Rs. 2,98,321 (£22,374) of which Rs. 8,200 were spent on veterinary research.

(3) Animal Diseases.—Mortality from Rinderpest was 18,500, from Haemor-

RHAGIC SEPTICAEMIA, 6,300, from FOOT AND MOUTH DISEASE, 1,200, from ANTHRAX, 300 and from BLACKLEG, 140.

(4) PREVENTIVE INOCULATIONS.—134,500 cattle were immunized against rinderpest by [? goat] tissue virus, 30,600 by serum alone and 96 with serum and virus. 49,000 were immunized against H.S., 2,180 against anthrax and 2,000 against blackleg.

(5) HOSPITALS AND DISPENSARIES.—432,600 animals were treated at 108 dispensaries and 77,250 animals were castrated.

(6) SPECIAL INVESTIGATIONS.—Observations were made on tuberculosis, Johne's disease, bovine brucellosis, coccidiosis, leishmaniasis, fowl plague, contagious ecthyma of goats, bovine cutaneous necrosis and canine septicaemia. In the treatment of surra a trial was made of giving two injections of " naganol " (2 g.) at an interval of 22 days with two doses of tartar emetic (60-100 c.c.) during this period at a seven day interval.—J. E.

INDIA, HYDERABAD-DECCAN. (1936). **Annual Report of the Stud and Veterinary Department of H.E.H. the Nizam's Government for the Year 1934-35.** [BADAMI, B. K.] pp. ii + 33. 8 figs. on 2 plates, 15 tables, 3 charts, 1 map, 2 appendixes. Hyderabad-Deccan: Govt. Central Press. [fcp].

(1) STAFF.—The state is divided into three circles, Hyderabad Circle, North Circle and South Circle and there were 99 veterinary assistant surgeons.

(2) ANIMAL DISEASES.—14,000 cattle died of RINDERPEST in 464 outbreaks, 3,000 of HAEMORRHAGIC SEPTICAEMIA and a few hundred from FOOT AND MOUTH DISEASE, ANTHRAX and BLACKLEG. Fifteen horses died of SURRA.

(3) PREVENTIVE INOCULATIONS.—Some 49,000 cattle were immunized against rinderpest by the serum-virus method and 83,000 by goat virus.

(4) SPECIAL INVESTIGATIONS.—Rinderpest serum and rinderpest virus were prepared for use in the field. Goats were rendered immune against rinderpest for 28 months after inoculation with goat virus vaccine. *Tryp. evansi* was considered to be the cause of trypanosomiasis in Hyderabad. Bovine brucellosis was diagnosed. Brief reference is made to other diseases. A table gives particulars of the helminth parasites identified during the year.

(5) HOSPITALS AND DISPENSARIES.—258,000 animals were treated at 85 dispensaries, 103,000 animals were treated on tour and 29,500 castrations were performed.—J. E.

INDIA, MYSORE. (1936). **Annual Administration Report of the Civil Veterinary Department for the Year, 1935-36, with the Government Review thereon.** [KRISHNIENGAR, K.] pp. 11. 1 map, 7 appendixes. [fcp].

(1) STAFF.—No details are given.

(2) ANIMAL DISEASES.—Five outbreaks of RINDERPEST, 545 outbreaks of HAEMORRHAGIC SEPTICAEMIA, 1,300 of ANTHRAX, 760 of BLACKLEG and 140 of SHEEP POX were reported. FOOT AND MOUTH DISEASE prevailed and PARASITIC INFESTATION of livestock was severe in some places.

(3) PREVENTIVE INOCULATIONS.—1,420 cattle were immunized against rinderpest by goat virus, 290 cattle with serum and virus and 50 with serum alone. 47,000 cattle were immunized against H.S., 19,000 against anthrax and over 50,000 cattle against blackleg.

(4) HOSPITALS AND DISPENSARIES.—538,000 animals were treated at the 68 dispensaries, 23,000 animals were castrated, and 106,000 animals were treated on tour and 58,000 animals were castrated.

(5) SPECIAL INVESTIGATIONS.—Short notes are given on the investigation of

Johne's disease, parasitic infestation of sheep, spore vaccine against anthrax, nasal polypi in cattle, gastro-enteritis in cattle, virus diseases of poultry, blackleg in cattle and anthrax in sheep.—J. E.

United States of America. (1935). **Report of the Division of Veterinary Science Michigan State College of Agriculture and Applied Science, East Lansing, 1935.** [Giltner, W.] pp. 63. 3 figs., 26 tables. [8vo].

The educational requirements of the veterinary college, as from the " fall term " of 1935, necessitate one year's study of the fundamental sciences to be carried out at an approved college, prior to the four years' veterinary curriculum.

An analysis of the diseases dealt with during the year is given for each department. Two disease control schemes are in progress, firstly, participation in the federal project for the eradication of bovine contagious abortion, and secondly, a scheme for the control of horse parasites by the administration of carbon disulphide ; it is estimated that already 20,000 horses have been dosed under this scheme.

Research work on mastitis includes attempts at diagnosis by the aid of dyes, and prophylaxis by means of " lacto-vaccine". Work on the control of coccidiosis in poultry by hygienic measures, and by the feeding of crushed oocysts, was carried out.

A short report is given showing the influence of high frequency alternating currents upon various kinds of animals.—H. H. Holman.

Finland. (1936). Eläinlääkintölaitos maatalousministeriön eläinlääkintöosaston kertomus vuodelta 1935. [**Report of the Civil Veterinary Service for 1935**]. [Kankaanpää, V.] pp. 64. [Numerous tables]. Helsingfors : Valtioneuvoston Kirjapaino. [4to]. [Abst. from French and Swedish summaries].

The staff remained unchanged as did the total number of veterinarians in the country, the latter being 262.

State Veterinary Laboratory.—Tables are given showing the work done. The numbers examined and the numbers found infected were as follows :– Bovine Brucellosis, 213 out of 1,055 ; Equine Brucellosis, 3 out of 3 ; Porcine Brucellosis, 0 out of 6 ; Bovine Tuberculosis, 92 out of 251 ; Porcine Tuberculosis, 95 out of 152, and Anthrax, 19 out of 224. One tuberculous camel was also reported. Figures for biological products prepared are given.

171,190 cattle were tested with tuberculin ; 1,294 (0·76%) strong and 3,627 (2·12%) weak reactions were obtained. Results of tests made between 1908 and 1935 are given in a table. The present incidence (2·88%) is the lowest on record.

Cultures of *Mycobact. tuberculosis* were isolated from 92 of 764 samples of material from domestic animals : in 87 cases the human type was present and in 8 cases the bovine type [all apparently from cattle].

Rabies was observed in only one dog – near the Russian frontier.

Strangles of a virulent type was wide-spread. Abattoir statistics are given in various tables.—J. E.

Colombia. (1936). Labores del Congreso de Medicina Veterinaria que se reunió en Bogotá, el 3 de Julio de 1936. [**Report of the Veterinary Congress, Bogotá, July, 1936**].—*Rev. Med. vet., Bogotá.* **7.** 139-142.

Tuberculosis is common in cattle, and the fact that its existence is rarely detected by the breeders has undoubtedly contributed to its spread.

Bovine contagious abortion was discussed, with recommendations as to its prevention and eradication.

There was extensive discussion on the various equine diseases due to trypanosomes, which threaten total destruction of the horses of the country. The bovine species is also considerably affected by these diseases.

The gravity of the incidence of rabies in Colombia which has reached truly alarming proportions in some districts was discussed. A permanent commission was created to deal with this disease.

The inadequate veterinary inspection at the ports and frontiers, resulting in the entrance of contagious diseases previously unknown in the country, was discussed.

The necessity for encouraging sheep farming was emphasized, the country being very suitable for sheep breeding.

The " Remount Section " was congratulated on its present organization for ending the importation of horses and thus keeping money in the country, and preventing the entrance of diseases hitherto unknown.—W. L. MARSHALL.

GREAT BRITAIN. (1937). **Report of Proceedings of the International Society for Microbiology, Second International Congress for Microbiology, London, 25 July – 1 August 1906.** [Edited by R. ST. JOHN-BROOKS]. pp. xiii + 579. London. [8vo] [In English, French and German].

The work of the congress was divided into eight sections including all branches of microbiology and virus diseases. Hundreds of reports were presented. The work upon which the reports and discussions are based has in most cases been published elsewhere and therefore included in this *Bulletin*. Those of veterinary interest are dealt with in *Index Veterinarius*. Readers should obtain the original publication. —J. E.

BOOK REVIEWS.

HAUDUROY, P., EHRINGER, G., URBAIN, A., GUILLOT, G., & MAGROU, J. (1937). Dictionnaire des bactéries pathogènes. [**Dictionary of Pathogenic Bacteria**]. pp. 597 + 48. 5 figs., 1 appendix. Paris: Masson et Cie. [8vo] [Fr. 140].

Many bacteriologists, who are compelled to work in a somewhat restricted field, are occasionally confronted with organisms of a type with which they are relatively unfamiliar. The identification of such bacteria is frequently a matter of difficulty and the numerous text-books on general bacteriological technique are usually too complex to permit the investigator to classify such organisms with rapidity.

The book under review is of the nature of a true dictionary and as such should prove of value. In general, it presents definite similarities to Bergey's Manual of Determinative Bacteriology which, incidentally, is likely to remain the standard book on this subject for some time, but the authors by rigorous selection have been able to give fuller details of each organism described. In the preface, they explain that they have endeavoured to compile a list of all the important pathogenic and of certain selected saprophytic organisms which are of general interest to the student of human, animal and plant pathology. The organisms are classified in alphabetical orders of families, *e.g.*, *Corynebacterium*: *C. acnes.*, *C. annamensis.*, *C. arthritidis-muris*, etc. Very brief notes are given on the morphology, cultural and biochemical characters and pathogenicity or toxicity of each organism.

The compilation of a book of this nature is undoubtedly beset with numerous difficulties, particularly in view of the absence of agreement on the rules for the classification and nomenclature of bacteria. The code established in Vienna in 1903 and recently revised at the Botanical Congress in Cambridge, 1930, has been

followed as far as possible. The classification of Bergey based upon the recommendation of the American Society of Bacteriologists has been largely adopted, but there has been no hesitation in departing from this scheme in certain directions.

The authors have forestalled criticism by admitting that in a publication of this nature certain omissions are bound to occur which doubtless will be rectified in future editions. Amongst other points, it may be suggested that some reference should be made to the pasteurella groups, I & II, as described by JONES and LITTLE, while some revision of the genus *Streptococcus* is probably necessary in the light of recent advances.

The classification of the *Salmonella* is not in accordance with modern concepts, but an appendix is provided, in which the list drawn up by the Subcommittee on Nomenclature of the International Society of Microbiology is given in detail.

A number of extremely useful tables on the differential characters of the important Gram-negative bacteria of the groups *Aerobacter*, *Alcaligenes*, *Eberthella*, *Escherichia*, *Proteus*, *Salmonella* and *Shigella* is also appended.—R. E. GLOVER.

BESREDKA, A. [Prof., l'Institut Pasteur]. (1937). Les immunités locales. **[Local Immunity]**. pp. 224. [Numerous refs.] Paris: Masson et Cie. [8vo] [Fr. 35].

The theories of Besredka on local immunity have undoubtedly been followed with great interest. This small book, which gives a comprehensive survey of his ideas with a wealth of detail, will doubtless be welcomed alike by those who wholeheartedly accept them and by those who adopt a more cautious attitude.

The first three chapters are concerned with the principles of local immunity as enunciated by the author: they are followed by nine chapters dealing with the local immunity of various organs, *e.g.*, skin, lungs, meninges, intestines, etc. Local immunity in plants and local passive immunity are also considered.

B. complains that bacteriologists are unwilling to discard the humoral mechanism of immunity in favour of his theory of local resistance to infection. Possibly his arguments would carry more weight with the sceptical if he had presented his views with a little more moderation instead of seeking to extend his hypothesis of local immunity to a very large range of disease conditions. For example, the statement that, following the injection of BCG into the spleen, this organ alone acquires an immunity against an infection with virulent tubercle bacilli, may be questioned; while the efficacy of dead vaccines given by the mouth is still a debatable point.

The book is written in an interesting fashion and each chapter is provided with a bibliography which provides valuable information on the subject under review.—R. E. GLOVER.

RAW, N. [C.M.G., M.D., M.R.C.P.]. (1937). **The Control of Bovine Tuberculosis in Man.** pp. viii + 128. London: Baillière, Tindall & Cox. 12 plates, 5 tables. [8vo] [6s.]

The data which are given in this book are already well known and have been presented in a more concise and accurate manner in other publications. As a scientific treatise the book is of very little value although it might prove of some service in the education of the public to the dangers which may arise from the ingestion of milk infected with tubercle bacilli. The main lines of argument are concerned with the methods of transmission of bovine tuberculosis to man and the effects which the organism will produce in the body.

Few will disagree with the author's plea for some form of heat treatment of milk derived from herds which are not tuberculin-tested, but it is doubtful whether

his contention, that bovine bacilli can be transformed into human bacilli by a prolonged sojourn in the human body, will be accepted, especially as his evidence on this point is not convincing. His claims for the efficacy of a heat-killed vaccine of his own preparation in the immunization of calves are also problematical. One searches in vain for accurate information on the results of applying this vaccine, but the statements which are made are of an extremely vague character as the following quotations will show :–

" Most satisfactory results have been obtained. Any infection which the calf is exposed to is of so mild a character that it is easy to give sufficient immunity to the calf to resist it " (p. 30). " Some hundreds of animals have been inoculated for testing the powers of immunization of healthy animals, and with excellent results " (p. 40). " Up to the present over 1,000 calves have been vaccinated. At the end of a year, and in many cases again at the end of the second year, these calves were tested by Pasteur's tuberculin, and in practically all cases the result has been, so far, negative " (p. 68). " This [vaccination] has been done by competent veterinary surgeons, and we have records of over 200 calves. The results are excellent, and the immunity is at least over two years, and probably longer " (p. 79).

The book is also marred by a constant reiteration of certain statements. Thus KOCH's admission in 1908, that the views he originally held on the probability that bovine bacilli could not be conveyed to man, were incorrect, is cited in three different places – in two instances the wording is almost identical.

A short chapter appears on tuberculosis in the cat and the dog. On the basis of an examination of *one* case in each species from which bovine strains were isolated, the conclusion is drawn that the risk of infection from the dog and cat to human beings is almost negligible. The fact that approximately 50% of the cases reported in the dog have been due to the human type, is entirely overlooked.

—R. E. GLOVER.

RICHTERS, C. E. [Prof. Dr. med. vet.]. (1937). Die Tiere im Chemischen Kriege. [**Animals in Chemical Warfare**]. pp. 251. 119 text figs., 16 figs. on 8 plates. [Numerous refs.] Berlin : Richard Schoetz. [2nd Edit.] [8vo] [RM. 11.20]. [See also *V. B.* **5.** 179].

An extended edition of a book well received when first published in 1932, and already translated into Italian and Turkish, though not into English.

A short survey of the development and probable future of chemical warfare is followed by a discussion of the properties of compounds used and of effects upon animals. The special pathology and therapy of disorders produced in domestic animals by irritant, narcotic and poisonous gases is treated under four headings, (a) products of the class including phosgene, chlorine, organic halogen derivatives, and nitrous gases, which hinder respiration or oxygen transport but are not necessarily irritant ; (b) products of the class including dichlordiethylsulphide (mustard gas or yperite) and chlorvinyldichlorarsin (lewisite) which are irritant and produce local changes in living cells, particularly of mucous membranes ; (c) organic derivatives of arsine (Clark gas and adamsite) which are powerful irritants especially for the respiratory passages, and (d) other poisonous gases such as carbon monoxide and hydrocyanic acid which affect the blood and nervous system.

A chapter is also devoted to products which form artificial clouds with atmospheric moisture, such as sulphur trioxide, phosphorus, carbon tetrachloride and zinc dust (Berger mixture), the main purpose of which is to affect vision. The sixth chapter considers the dog as a gas detector, the seventh the protection of animals and foodstuffs. The last chapter devotes a few pages to the possibility of bacteriological warfare.—H. H. GREEN.

SCHUDEL, Lydia. [Hämatologische Laborantin der Medizin. Universitäts Klinik Zürich]. (1936). Leitfaden der Blutmorphologie. [**Manual of Blood Morphology**]. pp. 45. 13 plates. Leipzig: Georg Thieme. [8vo] [RM. 6.80]. [In English, French and German].

In a foreword Prof. NAEGELI emphasizes the importance of standardizing blood examinations and recommends this book as an account of the ideas current in his clinic. The book is a brief and clear description of the technique of making smears and counts, of staining by the May-Grünwald-Giemsa method, and of keeping haematological records. Haematopoiesis and toxic and pathological conditions of the blood are described and beautifully illustrated.—NORMAN HOLE.

HARRIS, L. J. [Sc. D., D. Sc.] (1937). **Vitamins in Theory and Practice.** pp. xix + 242. Numerous figs. and tables. London: Cambridge University Press; New York, Toronto, Bombay, Calcutta & Madras: Macmillan; Tokyo: Maruzen & Co. Ltd. [2nd Edit.] [8vo] [8s. 6d.]

This book is a masterly, pleasantly written, up-to-date survey, packed into 242 pages of large clear type without loss of accuracy or omission of essential matter, by an expert on vitamin research.

It can confidently be recommended to all groups of reader from the household economist, to the biochemist not actually engaged in its special field and the medical man or veterinarian anxious to obtain a bird's eye view of the present status of knowledge on vitamins.—H. H. GREEN.

BALDWIN, E. [B.A., Ph.D., Fellow of St. John's College, Cambridge; University Demonstrator in Biochemistry, Cambridge]. (1937). **An Introduction to Comparative Biochemistry.** pp. xviii + 112. London: Cambridge University Press; New York, Toronto, Bombay, Calcutta & Madras: Macmillan; Tokyo: Maruzen Co. Ltd. 11 figs., 9 tables. [Numerous refs.] [8vo] [5s.]

This book, intended primarily as an introduction to comparative biochemistry for the student, cannot fail to be of interest to all concerned with the elucidation of biological problems in whatever aspect. The average biologist may indeed wonder how biochemistry can afford much aid to the study of the problems of evolution but, as B. points out, " the task of the biochemist is, after all, the study of physicochemical processes associated with the manifestations of . . . life in its general sense ". A deeper knowledge of the biochemistry of the lower forms of life throws light not only on evolutionary problems but on the relationships of the lower to the higher and more complex forms of life, and must ultimately be of great value in furthering the understanding of these relationships, especially from the point of view of disease. This branch of biochemistry is yet in its infancy and B. has assembled in this little book, in clear and readily understandable language, a concise outline of the science and has welded into a most presentable form a vast mass of facts culled from a wide variety of scientific literature.

The book is well printed, the general arrangement of tables and figures is good, and an excellent bibliography is given to enable those interested to delve more deeply into detail. Only a minimum of chemical formulae is quoted, and these are most lucidly set out. Sir Gowland HOPKINS has contributed a foreword and one feels that Dr BALDWIN is to be congratulated on a courageous exposition of seemingly difficult subject matter.—ALFRED EDEN.